NETWORK WORLD

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Use of ISDN PRI to help firm grow

By Wayne Eckerson
Staff Writer

OMAHA, Neb. — WATS Marketing of America, Inc., an early user of AT&T's ISDN Primary Rate Interface facilities, recently said it anticipates the service will enable it to handle one million additional calls a year.

The Integrated Services Digital Network service, currently provided over two T-1 lines as part of a 3-month-old field test, has already enabled the telemarketing firm to keep more accurate and up-to-date customer records and to handle peak calling periods better. Six more Primary Rate Interface lines are scheduled to be installed by December.

"The ISDN service is proving to be a real asset for us," said Daniel Denine, director of systems and communications for WATS Marketing. "It is a technological advancement that will benefit the telemarketing industry."

WATS Marketing, a wholly owned subsidiary of American Express Co., handles customer inquiries and processes orders for businesses, including American Express. The company has 425 operators handling an average of 10,000 calls an hour, according to Denine.

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Francis Erbrick, UPS vice-president of information services, explains the role of networking in his company's new marketing thrust.

Int'l network helps UPS set sights on global market

United Parcel Service net will help track 550,000 packages delivered by air to 41 countries daily.

By Bob Brown
Senior Writer

NEW YORK — United Parcel Service, Inc. (UPS) last week announced a major expansion of its international air package delivery service into 19 more countries, a bold move made possible in large part by the company's 2-year-old international network.

In a press conference held here, UPS, a $9.7 billion privately owned company, said it will soon service 41 countries, including the People's Republic of China and Australia.

Company officials said UPS' international computer network, dubbed the International Shipments Processing System (ISPS), played a key factor in the decision to expand UPS' business worldwide. Last year, the company delivered, on average, 10.5 million packages daily around the world.

ISPS complements UPS' largely domestic UPSnet network and helps reduce delays in international shipments by generating documents needed to clear pack-

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IBM enhances DB2, reveals DBMS plans

Firm pledges to add distributed capabilities to the data base products in its SAA architecture.

By Barton Crockett
Senior Writer

WHITE PLAINS, N.Y. — IBM upgraded its flagship relational data base management system here last week and issued a major statement of direction promising to offer distributed versions of most of its DBMS products.

Version 2 Release 2 lets IBM's popular Database 2 (DB2) for the first time read information in multiple remote DB2 data bases and update files in one remote DB2, a small but significant step on the way to introducing fully distributed DBMSs.

IBM also spelled out its intention, in a prepared statement, "to provide distributed data capability across all Systems Application Architecture [SAA] computing environments."

"Our vision of the future," said Gary Ferdinand, IBM's manager of advanced data base products, is to make it possible "to have an application program extract data from any number of [DBMS] sites on an SNA network. Ultimately, application programs themselves will be divided up and executed in different sites, transparent to the user."

Ferdinand said distributed DBMSs are the key to making such networks possible. Just as a DBMS on a mainframe manages data base inquiries, a distributed DBMS would handle inquiries for data anywhere in a network.

"The easy part of this kind of environment is building the communications links," Ferdinand said. "To get what you really want, which is transparent access to data and applications across a network, you need distributed data bases."

Users and analysts said IBM's

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Group sets health care net standard

By Rex Bowman
West Coast Correspondent

TUCSON, Ariz. — A group of hospitals, health care information systems vendors and consultants has developed a communications standard for its industry intended to simplify the task of networking computer systems within and between health facilities.

The effort, a multilayered protocol called Health Level 7 (HL-7), complements Open Systems Interconnection standards as well as de facto network standards such as Transmission Control Protocol/Internet Protocol and Digital Equipment Corp.'s DECnet.

The committee pushing HL-7 was originally established in March 1987, when the Hospital of the University of Pennsylvania convened a meeting of 15 vendors and health care institutions to consider the need for such a protocol. Two weeks ago, 85 representatives from hospitals and their vendors attended a committee meeting here.

The momentum behind HL-7 is driven by the fact that, over the years, many hospitals automated their various departments using equipment best suited for their specific applications. The result is a hodgepodge of systems that use different communica-

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NETLINE

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MCI GOES TO COURT in an effort to block the FCC decision allowing Tariff 15. Page 2.

BUCKING THE TREND, a network manager lands the equivalent of a CIO post at Weyerhaeuser Information Systems. Page 2.

RETAIL MERCHANTS MOVE stock faster with an EDI program called quick response, the hottest topic at NRMA. Page 4.

PARADYNE CUTS products and consolidates facilities, resulting in a 3Q loss. Page 4.

USERS FIND FAVORABLE the management features of IBM's latest NetView version. Page 4.

WANG UNVEILS software for IBM-Wang connectivity. Page 6.

A SWITCH IN TIME may save the future of data PBX vendors. Page 41.

NEWSPAPER

FEATURE

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Users cultivating hybrid methods to manage nets

Homegrown systems are helping companies manage the diversity of network elements.

By Chuck Papageorgiou
Special to Network World

Faced with difficult conditions and a changing environment, farmers long ago developed hybrids to improve the yield and quality of their crops.

Today's network planners and users have similar problems. With equipment from a variety of vendors using different media and divergent protocols, users must develop effective hybrid network management systems to handle the often harsh communications climate.

The term "network management system" encompasses a variety of products and services. Recently, net management systems have evolved from a collection of modules, such as IBM's Network Communications Control Facility (NCCF) and Digital Equipment Corp.'s Network Control Program (NCP), to more comprehensive systems, such as IBM's

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MCI wages court battle to reverse FCC Tariff 15 rule

AT&T's Competitive Pricing Plan assailed by MCI, FCC commissioner as unlawful and unfair.

By Anita Taff
Senior Correspondent, Washington

WASHINGTON, D.C. — In an effort to reverse the FCC's decision to allow AT&T to proceed with Tariff 15, MCI Communications Corp. recently took its battle to court, arguing that the tariff is unlawful, a sentiment echoed by FCC Commissioner Patricia Diaz Dennis in a statement she issued last week.

MCI asked the U.S. Court of Appeals for the District of Columbia to review the Federal Communications Commission's decision to allow Tariff 15 to go into effect while it investigates its legality.

MCI's petition said the FCC should have rejected the tariff because it violates provisions of the Communications Act of 1934. MCI also asked the court for expedited handling of the case.

Diaz Dennis, who has said she believes the FCC erred by allowing Tariff 15 to go into effect, issued a statement last week outlining her concerns. She said there is "a strong likelihood" that the tariff is unlawful and therefore should be suspended during the investigation.

Tariff 15, also referred to as AT&T's Competitive Pricing Plan, allows AT&T to offer below-tariff rates to customers being wooed by competing carriers offering similar deals. The first pricing plan outlined by AT&T below tariff was designed for Holiday Corp.

The issue has sparked a heated legal debate because it appears Tariff 15 could be in violation of Section 202 of the Communications Act, which forbids unjust or unreasonable discrimination in the provision of similar services.

AT&T contends that the tariff would allow it to make a competitive response to less regulated, nondominant carriers that it claims are undercutting its ability to compete in the market.

Diaz Dennis said she is not persuaded by that AT&T argument because the FCC has never approved discounts limited to a single customer, even in cases where the company's ability to compete was in question.

"The commission has given every indication that such individualized discounts, especially when offered by a dominant carrier, would be highly suspect, if not unlawful on their face," Dennis said.

MCI is basing its appeal on a similar premise. Provision of service by AT&T to one customer under special conditions is unlawful

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Network manager rises to post of CIO for company

Weyerhaeuser exec follows uncommon path.

By Barton Crockett
Senior Writer

TACOMA, Wash. — With computer and communications departments merging, network managers increasingly complain that the top jobs pass them by, only to be filled by their data processing brethren.

One manager who bucked this trend is Susan Mersereau. She recently moved from director of telecommunications to vice-president and general manager at Weyerhaeuser Information Systems (WIS), the communications and data processing subsidiary of paper products conglomerate Weyerhaeuser Co., based here.

In her new job, Mersereau heads the information systems division, a job comparable, she said, to chief information officer.

Mersereau said her communications experience was invaluable in landing the promotion.

"I work in a highly networked corporation," she said. "As a result of working with several groups in my communications capacity, I've gained a companywide perspective, which is important in this job."

At WIS, Mersereau controls an organization with 450 employees. This group manages the information systems and voice and data networks that serve most of Weyerhaeuser's 180 office sites nationwide. WIS also sells information processing and communications services to other firms.

According to some headhunters, a move like Mersereau's, from director of communications to CIO, is difficult for most communications managers.

"Certainly, the people who tend to become CIOs are the systems people," noted Norbert Gottenberg, managing director and head of the information systems practice at the headhunting firm Russell Reynolds, Inc. in New York. "These are the people with the exposure and the budgets that get them the top job."

Yet Mersereau isn't shy about going against the grain. She used a liberal arts background to land a job as director of MIS with the Seattle School District. She later transferred to Weyerhaeuser as

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Briefs

Empire Net. The New York State Office of General Services last week awarded a contract to a team of vendors for a statewide digital voice/data network that will link all state agencies. It is the largest network contract the state has ever awarded. Empire Net will cost $180 million over a five-year period and save the state an estimated $150 million over the life of the contract.

The network will be provided by a consortium of New York companies. As the prime contractor for the network, Eastern Microwave, Inc. will provide long-distance microwave transmission services. New York Telephone Co., a Nynex Corp. operating company, will provide T-1 and other digital services. IBM will supply more than 100 Network Equipment Technologies, Inc. Integrated Digital Network Exchange T-1 multiplexers. Nynex's Information Solutions Group, Inc. will provide computers and systems integration services, and Nynex Business Information Systems Co. will provide several thousand multiplexers and maintenance.

Network Strategies, Inc. of Fairfax, Va., was the consultant for Empire Net, which will consolidate multiple analog networks that use more than 8,000 circuits to link 98 New York state agencies, including the state lottery network and its 4,000 lottery sales agents.

U.S., UK pact inked. As expected, the U.S. and the UK signed an agreement this week that should greatly ease restrictions governing the use of private lines between the two countries ("U.S. agreement with UK to allow advanced services," *NW*, Oct. 3).

The pact, according to Phil Onstad, a member of the public policy committee of the International Communications Association, will let users support services between the countries that are currently prohibited by international treaty, such as electronic data interchange.

Satellite rules. The second session of the World Administrative Radio Conference on the Use of Geostationary Satellite Orbit (WARC ORB-88) wrapped up its work last week and signed a new international treaty governing the distribution of satellite and radio bandwidth among countries.

The goal of the session was to find a formula that would ensure developing countries have equal access to the crowded satellite orbit space above the earth. Several of these countries have complained that this space will be filled before they are able to launch their own satellites. The new rules adopted by WARC ORB-88 go into effect on March 16, 1990.

RBHC keeps stake in BELLCORE. US West Advanced Technologies, Inc., a subsidiary of regional Bell holding company US West, Inc., last week said it has withdrawn its notice of intention to sell its stock in Bell Communications Research, Inc. (BELLCORE).

US West and the six other RBHCs are co-owners of BELLCORE, a Livingston, N.J.-based research and development group. In December 1986, US West told BELLCORE it planned to sell its interest in the group within three years. In the interim period, US West built its own research and development facility in Englewood, Colo.

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Paradyne reports 3Q loss due to cutbacks, severance

Firm to swallow $26m charge against earnings due in part to decision to drop older products.

By Bob Brown
Senior Writer

LARGO, Fla. — Paradyne Corp. last week said it will report a third-quarter loss due largely to a $26 million charge against earnings it is taking for product cutbacks, facilities consolidation and severance payments.

The data communications equipment maker did not specify how much it would lose for the quarter, which ended Sept. 30, or how its revenue would fare. For the corresponding period a year ago, Paradyne reported net income of $278,000 on revenue of $58.2 million.

A major portion of the impending charge stems from Paradyne's decision to withdraw several older and stagnant product lines beginning Nov. 1, the company said.

Phasing out these products "will allow the company to lower its cost of doing business and invest in those products and services that have potential for providing a better return on our investment," said John Mitchum, who joined Paradyne as its president and chief executive officer in June.

Products the company is withdrawing from the market include its older generation packet-switching and data encryption products, the PDS 270 and PDX Messenger display terminals, response transaction-processing systems and some peripheral products. Paradyne will, however, continue to service these products.

The company plans to increase its focus on network management systems, modems, statistical and T-1 multiplexers, channel extension systems and customer service and support offerings. It will also continue to sell its new packet-switching equipment.

"The company is sharpening its focus on strategic opportunity," Mitchum said.

These strategic opportunities include new OEM agreements and the recently announced Factory Authorized Distributor Program, which targets small and medium-sized customers.

The expected charge for the third quarter also covers severance pay for about 300 employees — about 10% of Paradyne's work force — that were laid off during the summer ("Paradyne lays off 300, moves to stop buyout bids," *NW*, Aug. 8).

A 40% reduction in building space occupied by corporate and production employees here will also contribute to the third-quarter charge, but it will save the company a few million dollars in 1989, the company said.

Larry Cynar, an industry analyst at the San Jose, Calif.-based market research firm Dataquest, Inc., said, "I think this was long overdue. It's an absolute requirement of a company that, like most of the traditional datacom companies, needs to adjust to what's happening in the world of networking."

While Cynar said he is unsure about how well Paradyne will fare as a result of the housecleaning, he emphasized that the company has several strong product lines that should continue to attract new customers.

Paradyne's Pixnet channel extension systems, for example, were given a credibility boost last year by IBM's decision to introduce a similar product. In the past, IBM has fought against such products, Cynar said.

Users cite best features of latest IBM NetView release

Less programming time, fast automation top list

By John Cox
Senior Editor

According to users, some of the most attractive features of IBM's latest version of NetView are those that promise to simplify the automation of net control procedures and improve communications between NetView programs running on large and mid-size computers.

The result will be less demand on pricey programmer time, faster automation and greater centralized control over far-flung network resources, according to two NetView users. IBM announced NetView Release 3 on Sept. 20 along with enhancements to other NetView applications ("Networks shine in IBM product rollout," *NW*, Sept. 29).

Users' assessments of the new NetView features varied according to their respective network needs.

Of special interest to Ronald Mura, director of data communications at John Hancock Mutual Life Insurance Co. in Boston, were the new asset management capability and IBM's new NetView starter kit.

For Harry Kochman, director of data communications at Continental Insurance Co.'s Neptune, N.J., data center, changes to the NetView LAN Manager program will be helpful in managing local nets in agents' offices around the country.

Both directors have a ready list of additional improvements they would like to see. And Kochman pointed out that questions still remain about the prudence of concentrating all network control on a single host.

The NetView changes did not come as a surprise to Kochman. "There's nothing there that people haven't asked for," he said.

REXX support

NetView's new support for REXX, a high-level procedural language that is part of IBM's Systems Application Architecture, is an important advance, said Hancock's Mura.

Previously, network managers had to use a more cumbersome language to write NetView Command Lists, collections of commands that automatically perform network management tasks. The previous language did not handle complicated tasks well, Mura said.

REXX will accelerate Hancock's own automation effort, begun a few months ago, Mura said.

Mura also singled out the new automated asset management capability as "tremendously important" in keeping track of equipment in big networks, saying that manual systems "fall apart fairly quickly."

The improved communications between NetView on a host and NetView on a mid-range system, such as the new Application System/400 (AS/400), offer a couple of potential benefits, according to Continental's Kochman. For one, central-site managers will be able to manage remote mid-range systems more closely. In turn, that improved capability could reduce the need for trained systems professionals to be present at remote locations.

In the past, host-based NetView could only receive a message that an alert condition existed on a remote mid-range system. The operator had to log on to the smaller system to access the detailed information about the alert. Now, this information is passed directly to the host program.

This improved interface could prove valuable if Continental decides to upgrade its large dial-up synchronous Systems Network Architecture network composed

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Correction: An editing error in the story "What you don't know about recruiters can hurt you" (*NW*, Oct. 3) inadvertently altered the meaning of a sentence. The sentence should have read: "However, most experienced recruiters do not rely on resumes as their only search technique."

EDI quick response keeps retailers' shelves stocked

By Jim Brown
New Products Editor

WASHINGTON, D.C. — Taking a cue from the manufacturing industry, more and more retailers are keeping their shelves stocked with the hottest selling items and reducing the costs of placing orders by using an electronic data interchange (EDI)-based program dubbed "quick response."

Quick response, one of the topics addressed by retailers gathered here last week for the National Retail Merchants Association's (NRMA) 30th Annual Retail Information Systems Conference, is similar in many ways to the just-in-time approach used by major automobile makers. With just-in-time, automakers order parts so they will be delivered to plants as they are needed.

The idea behind quick response is to reduce the time it takes to reorder merchandise by tracking sales and inventory using price tags supporting the Universal Product Code (UPC) and EDI to reorder stock.

Retailers use scanners attached to electronic point-of-sale cash registers to collect UPC information from merchandise price tags. That information is uploaded to the merchant's host computer, which determines when inventory of a certain item gets below a predefined level and automatically creates an ANSI X12-compatible EDI purchase order. Retail store buyers review those purchase orders on line and make any changes before they are transmitted to vendors. Those vendors then ship the goods.

"We're committed to doing quick response with as many vendors as we can," Heflin said.

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"If you're replenishing your stores with exactly what you're selling, eventually you'll improve your profits," said Ray Heflin, manager of retail electronic systems for Little Rock, Ark.-based Dillard Department Stores, Inc. Dillard, which has 154 stores in 14 states and estimated 1988 sales of $3 billion, is conducting quick response tests with 27 vendors. "We're committed to doing quick response with as many vendors as we can," Heflin said.

Quick response also helps companies supplying retail stores to track customer ordering patterns better. Armed with that data, the suppliers can make more informed decisions about when to order the raw materials they need to make products.

Quick response relies heavily on in-store POS networks and links between remote stores and corporate headquarters. It also relies on computer-to-computer links between merchants and vendors.

Quick response relies on in-store POS nets and links between stores and headquarters.

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"In the last three years, we've seen a major movement in computer-to-computer communications," said Fred Asher, vice-president of MIS for Dayton Hudson Department Store Co., the Minneapolis-based division of Dayton Hudson Corp. Quick response has been an outgrowth of that movement, he said.

In fact, Asher said Dayton Hudson will use UPC labels on products in its stores and use EDI only with vendors that put UPC labels on their products in the factory.

Dayton Hudson currently uses EDI with 55 vendors. The company expects to add 18 more in October and reach 100 by the end of the year.

To meet the true quick response concept, merchants must tag merchandise with UPC labels. The bar-coded labels complement the stock-keeping unit (SKU) numbers most retailers currently use to track inventory. Those SKU numbers, however, typically do not include as much detail about products as a UPC label.

Merchants load the UPC information into host computers and build conversion tables to translate UPC label numbers into corresponding SKU numbers.

Clerks use a scanner linked to a register at the checkout counter to scan the UPC label. An in-store controller looks up that code typically stored on either an in-store controller or minicomputer and supplies the price to the register. If the UPC label cannot be scanned, the clerk can manually enter the SKU number via the register key pad.

The controller converts that number to a UPC label number and supplies the price.

Each transaction is recorded on the controller, and a complete file of the day's sales is uploaded to the host at certain intervals during the day or as a batch file at night.

A host application then deter-

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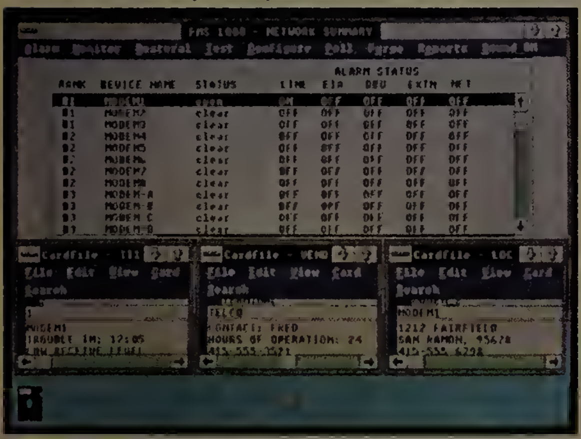

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ICA conference to feature a multivendor ISDN demo

By Bob Wallace
Senior Editor

DALLAS — The International Communications Association (ICA) is planning a multivendor Integrated Services Digital Network demonstration for its annual conference here next May, *Network World* has learned.

The ICA and Southwestern Bell Telephone Co. — an early and strong supporter of the project — acknowledged that they are working on the event. ICA spokesman Robert Eilers said the ICA will soon select the carriers and equipment suppliers for the planned demonstration.

An ICA member who requested anonymity said exhibitors should receive literature explaining and detailing the ISDN demonstration later this month. "Any exhibitor that has developed ISDN products or applications can participate in the demonstration," he said.

"ICA members need to see ISDN equipment and applications demonstrated. They are ready to start buying," the user said. The event will give vendors of ISDN equipment and applications an opportunity to show their wares.

Second demo possible

In a separate but related development, the promotion committee of the North American ISDN Users' (NIU) Forum has begun studying the feasibility of holding its own ISDN demonstration in late 1990, according to Karl Schohl, a member of General Motors Corp.'s advanced engineering staff and a member of the NIU Forum.

Vendors and groups participating in the study are GM; Electronic Data Systems Corp. (a GM subsidiary); IBM; the Corporation for Open Systems; ICL, Inc. (a London-based computer systems vendor); and Lachman Associates, Inc. (a Naperville, Ill.-based consulting firm), according to Schohl.

3 users, 3 vendors needed

"We would need at least three users and three vendors to make [the NIU Forum ISDN demonstration] a success," Schohl explained. The project will require NIU Forum approval, he noted.

Donald Berteau, an NIU Forum officer, said the two ISDN demonstrations will accelerate the development and use of ISDN equipment and applications. "They'll do more to promote ISDN than all other ISDN trials and tests in the U.S. combined," he said.

The ICA ISDN demonstration plan calls for two Southwestern Bell central offices to extend ISDN Basic Rate Interface lines to the Dallas Convention Center, the site of the ICA's 1989 conference.

The ISDN Basic Rate Interface specifies how customers can use and control a 144K bit/sec link — configured to Consultative Committee on International Telephony and Telegraphy standards — to hook telephones and computers to a telephone company's local exchange.

One of the two Southwestern Bell central offices is equipped with an AT&T 5ESS switch, while the other houses a Siemens Public Switching Systems, Inc. EWSD switch.

Both central office switches are already providing ISDN Basic Rate Interface service to a few corporations here, the source said.

The ICA and Southwestern Bell may decide to include other vendors' ISDN-compliant central office switches. "I would expect Northern Telecom would want one of their central office switches used in the ISDN demonstration," the source said.

Each ICA exhibitor planning to participate in the ISDN demonstration can choose which central office switch will provide its ISDN Basic Rate Interface service and how many ISDN Basic Rate Interface lines it needs, the source explained. He would not say if the booths are to be interconnected.

Variety of equipment

Exhibitors participating in the project are expected to demonstrate a wide variety of ISDN-compatible equipment, including terminal adapters and integrated voice/data workstations.

Applications could include personal computer-to-personal computer file transfer, message desk, full-motion videoconferencing and wideband audio transmission, the source said. These applications were demonstrated at Southwestern Bell's Advanced Technology Laboratory during the NIU Forum's recent meeting in St. Louis.

The ICA's 1989 ISDN demonstration will not be the group's first attempt to assemble an ISDN showcase, another source said. The users group had originally planned to hold an ISDN demonstration at its conference this year in Anaheim, Calif., but the ICA could not rent the space needed for the Northern Telecom DMS-100 central office switch that was slated to anchor the demonstration, he said.

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Users cite best NetView features

continued from page 4

of some 1,400 System/36 minicomputers located in agents' offices across the country. The insurer also has a leased-line network for on-line and batch applications.

Continental is considering upgrading the System/36s to the new, more powerful AS/400, Kochman said. If it does, the new NetView capabilities would enable the company to centrally manage AS/400s and their local communications lines from a central mainframe, he said.

While NetView would allow closer monitoring of any new remote AS/400 processors, it so far gives Continental nothing with which to manage the network's dial circuits, Kochman noted. "IBM doesn't really have the facilities to monitor dial modems," he said.

The result is that Continental programmers must develop, write, debug and maintain a group of custom programs for monitoring the dial network, he said. One of the most frequent problems is what Kochman terms an unproductive line, a dial-up line that for various reasons is not carrying traffic but is active and thus continues to run up a bill with the carrier. NetView cannot catch an unproductive line, he noted.

But as IBM adds more facilities to NetView, the processing burden on the host increases, despite NetView performance improvements, Kochman said.

"I always get a call from our capacity performance people who say, 'Please either bring NetView down or turn down certain facilities because it's interfering with our normal production work,' " he said.

"It's a good tool, but there's a price to pay for it, not just in terms of [cost] but in terms of the CPU resources," he said. "I think what you're looking at in a large network environment is buying separate processors just to do network management."

Wang software increases connectivity with Big Blue

New offerings boost communications functions.

By John Cox
Senior Editor

LOWELL, Mass. — Wang Laboratories, Inc. recently announced software products intended to provide more functions and a greater degree of transparency between Wang and IBM environments.

The products allow IBM terminals and applications in Systems Network Architecture nets to access Wang systems and applications. They also let Wang VS minicomputers act as nodes in SNA Distribution Services (SNADS) networks.

Improvements were also made to a handful of other products that support various IBM-Wang communications functions, including VS-to-IBM host links and various terminal support arrangements.

The connectivity announcements were designed to assure Wang customers and prospective customers that the company intends to deliver seamless integration with IBM, said Dennis Fahey, Wang's U.S. marketing manager for IBM interconnect products.

SNA and SAA included

The integration will include not only SNA-compatible products but also products that comply with IBM's Systems Application Architecture (SAA), IBM's plan for creating a uniform applications environment, Fahey said.

Taking aim at workstation operators and applications, Wang introduced two programs based on IBM's Advanced Program-to-Program Communications software, according to Fahey. APPC implements the LU 6.2 protocol to allow applications to talk with one another.

VS Access LU6.2 Applications Programming Interface (API) gives developers a set of programming calls that let a Wang VS application use APPC to talk with mainframe applications.

Programmers can embed these calls in an application much more easily and quickly than writing line after line of communications code, Fahey said.

The second software package, VS Access LU6.2 Services, manages the actual program-level communications between two computers. This software passes information requests and data between the Wang and IBM systems. Fahey likened it to a highway across which LU 6.2-compatible applications communicate.

Both applications are available now. LU6.2 Services is licensed at $1,500 to $6,000; LU6.2 API is licensed at $10,000.

Wang's new VS SNADS Services software enables a VS to be a node on an IBM SNADS network. SNADS is part of IBM's SAA for asynchronous, store-and-forward distribution of information within an SNA environment.

There are two separate components of the new software, and each can be bought separately. VS SNADS Services provides a VS system with the functions needed to work as a SNADS node. VS SNADS API is a set of calls that programmers can use to create applications that use SNADS, Fahey said.

SNADS Services is priced from $1,000 to $4,000; SNADS API costs $25,000. The software will be available in the fourth quarter of this year.

Other products announced include:

- A new release of Information Distribution Services, software that enables VS systems to communicate across SNA networks with IBM hosts.

The new release is intended to make the products easier to install and use. It also gives more control to network administrators, the company said. Prices range from $2,200 to $11,000, depending on the communications capabilities required.

- VS/PC SNA Services-3270, a program that enables IBM-compatible microcomputers from Wang and other vendors to be wired with coaxial cable to a VS providing gateway services. Previously, only microcomputers on an Ethernet could access the VS. Priced from $500 to $2,500, VS/PC SNA Services-3270 will be available in the last quarter of this year.
- A gateway software package called Interoffix, which was developed for Wang by Boston Software Works, Inc. The software runs on VS computers operating under Wang's recently announced Unix implementation. It allows users of Wang's office automation software to send mail and files to Unix systems, and vice versa, officials said.

Interoffix will be available in November. The license fee ranges from $6,000 to $10,000, depending on the processor.

- VS Access/3270, which enables IBM 3270 terminals to log on to applications on VS computers, was enhanced to support VM and DOS/VSE. Previously, it only worked with IBM hosts under MVS.

Wang also issued two statements of direction. The company pledged to create a gateway between VS systems running its own network management software and IBM's host-based NetView network management system, but the company did not detail those plans further.

Also, Wang said it will develop within the next two years interfaces and applications that let customers integrate voice, data, images and text over Integrated Services Digital Networks.

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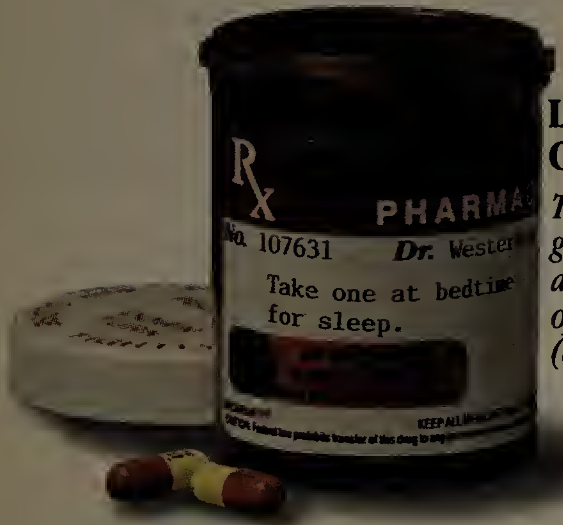

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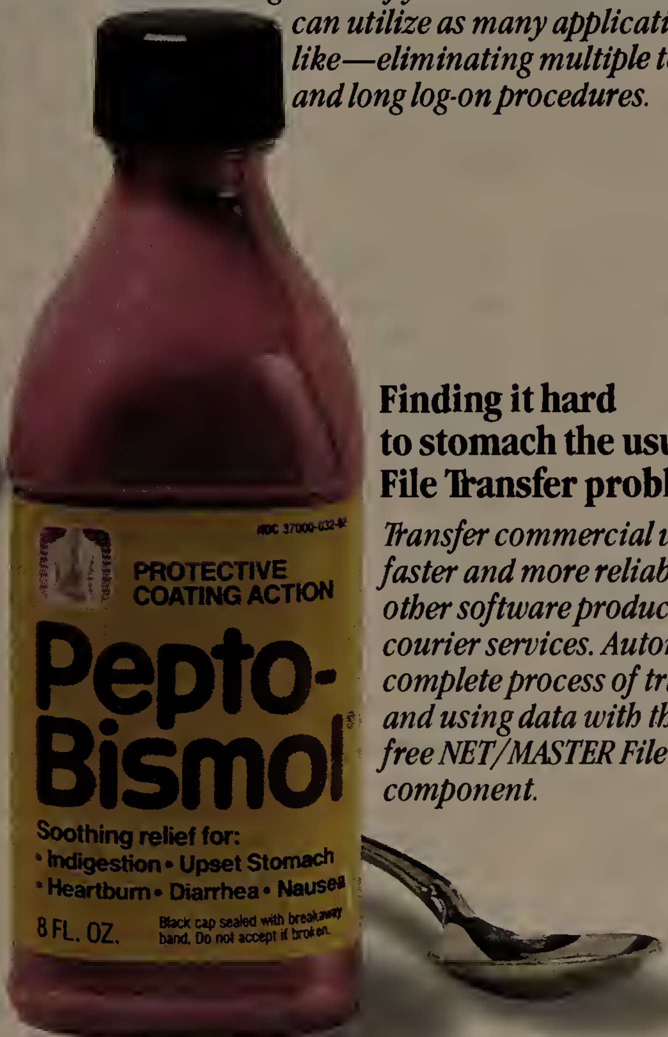
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New NCR Comten software adds token-ring support

Version 4.2 of ACF/NCP software allows users on token-ring local nets to access IBM hosts.

By Paul Desmond
Staff Writer

ST. PAUL, Minn. — NCR Comten recently announced a new release of its Advanced Communications Function/Network Control Program (ACF/NCP) that adds token-ring local network support to its family of communications processors.

Comten's ACF/NCP Version 4.2 enables users on token-ring networks to access IBM hosts through the communications processor.

The software supports Modulo 128 and adds Link Problem Determination Aid 2 for IBM 5860 series intelligent modems.

It also adds dynamic threshold alteration and support for Systems Network Architecture Network Interconnect session trace.

In addition, the token-ring connection is NetView-compatible and will pass information to NetView on events such as ring outages, congestion and dialing errors.

The ACF/NCP software can support up to 20 token-ring attachments when used with Comten's 5660 communications processor, up to 10 token-ring interfaces on the Comten 3695 and two interfaces when used on the 5620.

Linvel Karres, director of Comten's SNA Product Program, said the direct connection means token-ring users get faster response times from the host because the terminal-polling functions associated with Binary Synchronous Communications or Synchronous Data Link Control lines are eliminated.

"With a token ring, all of that type of supervisory overhead goes away," he said. "That is really where the performance improvements come."

Two other features new to Release 4.2 save costs on lines that link Comten processors.

The first, enhanced multipoint support, enables a Comten controller to support multiple devices on a multidrop line.

A single line, for example, can now be used to support a cluster controller, a communications processor and an IBM 9370 minicomputer, all at different locations, Karres said. This saves the cost of having separate lines running to each location.

In addition, any network link can be a switched link. This enables users to increase bandwidth during periods of peak transmission by dialing up extra lines as they are needed.

Token-ring support includes two new hardware interfaces. The Network Interface Adapter supports up to four token rings, and the Token Ring Interface Module supports one token-ring local network.

Karres said Comten will continue its policy of maintaining software compatibility across its entire line of communications processors, so users can be assured they will not have to upgrade equipment in order to implement the future versions of ACP/NCP.

Currently being beta-tested at an undisclosed site, the software will be available in increasing degrees of functionality beginning in the fourth quarter of this year.

Monthly licensing fees range from $176 for the Comten 5620XP communications processor to $672 for the 5660. Token-ring support ranges from $13 to $39 extra.

NCR Comten is a wholly owned subsidiary of NCR Corp.

3Com offers enhanced 3Station/2E

By Laura DiDio
Senior Editor

SANTA CLARA, Calif. — 3Com Corp. last week introduced the 3Station/2E, an enhanced version of its earlier 3Station dedicated network workstation, featuring new graphics and mathematical coprocessor capabilities.

The new 3Station/2E is an Intel Corp. 80286-based, IBM-compatible workstation, or "netstation." Like the original 3Station, the latest 2E version is an Ethernet-based diskless workstation designed to run the company's 3+ and forthcoming 3+Open network operating systems.

The device also runs Novell, Inc.'s NetWare Version 2.1, said Gary Rosekind, 3Station/2E product marketing manager.

"It's a 10-MHz Intel 80286-based machine that is 25% faster than the original version of 3Station," Rosekind said. It also features the enhanced Video Graphics Array (VGA) found in the IBM Personal System/2. VGA enables it to support such graphics-intensive applications as Microsoft Corp.'s Windows/286; Autodesk, Inc.'s AutoCAD; and Lotus Development Corp.'s 1-2-3.

"We also support higher resolution modes than those found in the Personal System/2 machines," Rosekind said. "This means that users receive clearer screen images in their low-end CAD systems or desktop publishing devices."

Additionally, the latest version of 3Station/2E supports 132 on-screen columns, compared with the standard 80 columns that are available on most current personal computers and compatibles, Rosekind said. "The 132-on-screen column feature is especially important to users of large financial spreadsheets because it allows them to view a lot more data on a single screen," he said.

Other enhancements include the ability to support an Intel

(continued on page 54)

IBM enhances DB2, reveals plans

continued from page 1

statement of direction was far more important than the technology the company announced.

"I see the goal they set as significant, but the products they released are only a necessary first step in a very long-term evolution," said John White, vice-president of information systems and services at Texas Instruments, Inc. in Dallas.

Product limitations

Among the important elements still missing for a truly distributed DBMS is the ability to support data inquiries to different kinds of data bases. This is important because, in truly distributed networks, users will want access to multiple, multivendor DBMSs.

The new DB2 release also does not support file updates to more than one other DB2 data base. This limits the kind of application programs that can take advantage of the technology. For sophisticated applications to run on a distributed DBMS, it is vital that data be simultaneously updated on all computers on a network in order to maintain data integrity.

IBM did not give a date when it will deliver full distributed DBMS capabilities for all of its SAA platforms. Its new version of DB2 is not scheduled to ship until the third quarter of 1989.

But Chris Bird, program director of software management strategies with Stamford, Conn.-based consulting firm Gartner Group, Inc., offered an estimate.

Bird predicted that in the first quarter of 1990, or six months after shipment of DB2 Version 2 Release 2, IBM will announce the capability for other SAA-specified DBMSs to extract data from multiple DB2s.

One year after that, he speculated, IBM will announce the capability for one DB2 DBMS to update files on several other DB2 data bases.

And about three years after the shipment of DB2 Version 2 Release 2, he said, IBM will announce the capability for this data base to update files on other SAA-compliant data bases.

Optimistic estimations

Bird conceded that this may be an optimistic time frame since several difficult technical issues still need to be resolved. Top among these are finding ways to ensure data security and integrity across a network. He said his predictions represented Gartner Group's best calculation of the state of IBM's current programming effort and its historical timing of announcements.

Significantly, IBM announced no intention to support distributed data base access to systems from other vendors, even though several IBM staffers are working with a group that is designing a standard for such applications ("U.S. firms weigh draft of data base access standard," *NW*, Oct. 3).

IBM's Ferdinand said that any other vendor wishing to connect its data bases to IBM's must do so by writing its own gateway to the IBM system using LU 6.2 and Advanced Program-to-Program Communications standards.

EDI keeps shelves stocked

continued from page 4

mines if any item needs to be reordered and automatically produces a purchase order.

UPC labels include the data most needed by retailers, such as vendor identification, product style, color and size.

Currently, retailers try to keep SKU numbers as small as possible to minimize data-entry time at the checkout counter. This means that merchants often can tell only how many of a particular style dress was sold but not what sizes those dresses were.

As a result, buyers tend to reorder an array of sizes when inventory on a particular style of dress is low. This means merchants are often overstocked with odd sizes and must mark down those items.

Because quick response uses UPC labels, the vendor receiving the purchase order can attach UPC labels to the product at the factory. The vendor then labels the cartons used to ship the goods with a bar-coded shipping container label.

Workers receiving the cartons at store distribution centers scan those shipping container labels with a computer-attached device. The computer also has a copy of the purchase order that has been downloaded from the host, thus enabling distribution center workers to route each carton to the appropriate stores. Currently, distribution center workers empty each carton, ticket the items, repack them and ship them out.

"The whole thrust of this thing is to increase customer service by having the right items always in stock. And that will lead to more sales," said Marlon Brownlee, senior consultant with Arthur Andersen & Co.'s management information consulting division in New York. Arthur Andersen is currently researching the quick response concept and is expected to present an interim report at the NRMA's 78th Annual Convention in New York next January. The report is expected to be published in March.

Manager rises to post of CIO

continued from page 2

manager of advanced technology.

In 1982, she became Weyerhaeuser's director of telecommunications. In this job, she managed the construction of the company's current corporatewide voice and data network.

Mersereau acknowledged that being a woman in a male-dominated profession has made moving ahead difficult at times.

"When I graduated from college in 1968, there were very few women in business," she said. "Only recently has there been a pool of women in upper management roles. This is fine since most of the men I work with have been very, very helpful.

"The barriers I've faced are those I set up myself. I think women often wait for people to take charge of their career instead of moving ahead themselves," she said. "In myself, for instance, this has made me feel that I always needed another degree to move ahead. I think men tend not to feel this barrier."

MCI wages court battle

continued from page 2

and as such, the FCC has a duty to reject it, an MCI spokesman said.

This argument will have to be compelling, however, because MCI's appeal goes somewhat against established legal procedure. Normally, a company must wait until the FCC concludes its investigation of an issue before a decision can be appealed, the spokesman said.

John Hoffman, senior vice-president of external affairs at US Sprint Communications Co., which also strongly opposes Tariff 15, said that although he agrees with the validity of MCI's appeal, he is concerned that it may be premature. "The court doesn't like to review the actions of an agency until the agency issues a [final] decision," he said.

The court could decide to suspend the appeal until the FCC finishes its investigation, Hoffman said. According to the comment schedule established by the FCC in its Tariff 15 investigation, the earliest the agency will make a ruling would be December.

Jane Mago, an attorney in the FCC general counsel's office, said she doubts the court will act on Tariff 15 at this point and added that the FCC will probably file an opposition to the appeal.

INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS AND FINANCIALS

Worth Noting

GEC Plessey Telecommunications Co. of the UK recently unveiled a glow-in-the-dark phone that it is pitching to businesses as a way to increase employee safety in times of sudden darkness. The "glowphone" allows easy location and dialing of emergency numbers in the dark, the company said.

People & Positions

IBM recently elected **John Brooks Slaughter** and **Edward Woolard Jr.** to its board of directors.

Slaughter is president of Occidental College in Los Angeles. Woolard is president and chief operating officer of E.I. du Pont de Nemours & Co., where he is slated to become chairman and chief executive officer in April.

Susan Mersereau last week was appointed vice-president and general manager of **Weyerhaeuser Information Systems,** which provides computing and telecommunications services.

Mersereau replaces **Frank Guthrie,** who was named vice-president in charge of Weyerhaeuser Paper Co.'s Longview, Wash., manufacturing complex. Mersereau has been director of telecommunications at Weyerhaeuser since 1982.

Patrick Williams recently was named director of government relations of the **Telecommunications Industry Association (TIA),** a national trade organization of 600 vendors of telecommunications products and services. Williams will be responsible for presenting TIA members' views to Congress, the executive branch and the Federal Communications Commission.

Congress protects vendors from licensor bankruptcy

Bill ensures access to licensed technologies.

By Bob Brown
Senior Writer

WASHINGTON, D.C. — By a vote of 415-to-1, the U.S. House of Representatives last week approved legislation that would assure vendors continued access to computer software and other licensed technologies in the event of the licensor's bankruptcy.

The legislation, dubbed the "Intellectual Property Bankruptcy Protection Act," had been previously approved by the House Judiciary Committee and the Senate and now awaits the president's signature to make it law.

Under current law, if a company that licenses technology goes bankrupt, the trustee overseeing the bankruptcy can call in all licenses and resell them. A communications equipment vendor, for example, could lose a license if the licensor went out of business, leaving both the vendor and the users of its product without recourse.

The problem surfaced in 1982, when a bankruptcy trustee appointed to supervise the demise of Richmond Metal Finishers declared that copyright and patent licenses were like any tangible assets and could be sold to the highest bidder.

As a result, Lubrizol Enterprises, a division of Lubrizol Corp., lost a valuable license for a metal-finishing technology it had acquired from Richmond Metal Finishers.

Lubrizol sued to retain the license, but the Supreme Court refused to hear the case, letting stand a lower court's ruling that Richmond Metal Finishers' trustee could put the technology rights up for sale.

Similar outcomes in cases involving communications vendors would hurt users as much as vendors by "inhibiting the transfer of technology from one company to another and, ultimately, from the lab to the consumer," said a spokeswoman for the Computer and Business Equipment Manufacturers Association (CBEMA), a leading proponent of the bill. CBEMA members include Digital Equipment Corp. and AT&T.

Users would be deprived of products or services they normally buy from a vendor whose technology license has been stripped, she said.

Certain replacement parts for communications equipment, for

(continued on page 10)

INDUSTRY BRIEFS

The **Interlan** division of **Micom Systems, Inc.** last week announced it has been renamed **Interlan, Inc.** and will become a privately held company owned by **Odyssey Partners,** the New York-based investment firm that acquired Micom Systems last month.

Boxborough, Mass.-based Interlan provides local-area network products for work group and departmental environments.

US West Financial Services, Inc., a subsidiary of US West, Inc., recently reported that it acquired the **Fixed Asset Lending Division** of **Westinghouse Credit Corp.** for an undisclosed amount.

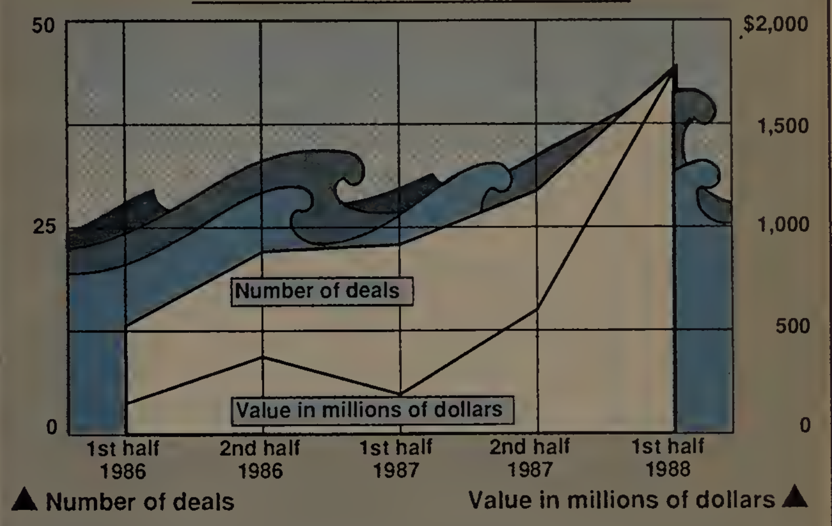
The purchase includes $575 million of loans and other assets. In addition, it will result in the transfer of about 175 Westinghouse employees at 21 offices throughout the U.S.

Acer Technologies Corp. of San Jose, Calif., and **Novell, Inc.** of Provo, Utah, recently signed a one-year, $4 million OEM agreement to bundle Novell's Advanced NetWare operating system on Acer's 386-based AcerServer 5200 local-area network file server. The new agreement, which expires in October 1989, builds on an agreement signed last year.

NCR Corp.'s Microelectronics Division recently formed a new business unit, **NCR Communications Business Unit,** to develop, market and manufacture semiconductor products for local network, Integrated Services Digital Network and other communications applications.

The new unit, based in Fort Collins, Colo., is initially marketing NCR's Highway Addressable Remote Transducer modem chip, which is used in the industrial communications market.

Rising tide of mergers and acquisitions in professional services



Professional services companies include firms that provide custom software and telecommunications development, consulting, education, facilities management and systems integration.

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: BROADVIEW ASSOCIATES, FORT LEE, N.J.

Merger mania takes on a new territory

Study finds buyouts of professional services companies vastly increased in first half of '88.

By Bob Brown
Senior Writer

Professional services firms have become attractive acquisition targets for equipment vendors because differences in value-added support services are now pivotal to winning big user contracts.

Fortunately for acquisition-minded vendors, many professional services firms, which provide everything from custom software development and consultation to facilities management and full systems integration, are seeking partners to compete with the few large firms that dominate the field.

In an attempt to satisfy the ever expanding needs of users, vendors of communications and data processing equipment went on a buying spree in the first six months of 1988, according to a recent report conducted by Broadview Associates, a Fort Lee, N.J.-based merger and acquisition investment banking firm specializing in the information technology industry.

The study said there were 43 deals worth $1.72 billion involving professional services companies in the first half of this year. That compares with 22 deals worth $192 million in the first half of 1987 and 13 deals worth $157 million in the first half of 1986.

According to the study, seven of the 11 largest professional services deals since the beginning of 1986 were announced in the first half of 1988. Those deals include Nynex Corp.'s acquisition — through its Nynex Information Solutions Group, Inc. — of AGS Computers, Inc. (consummated last week), Cincinnati Bell, Inc.'s purchase of Vanguard Technologies International, Inc. and IBM's buyout of PacTel Spectrum Services from Pacific Telesis Group.

The future promises to be filled with even more mergers and acquisitions. There are more than 3,000 independent firms offering professional services, according to Harvey Poppel, a Broadview Associates partner.

Poppel said the larger professional services firms are the most likely near-term targets. After they have been swallowed up, Poppel said, the industry will start eyeing smaller firms that specialize in one aspect of communications, such as local networks or network management.

Dean Crawford, president of Vanguard Technologies in Fairfax, Va., said he expects networking to be "the big nut" in future deals.

Most firms realize they need partners to compete with the likes of Electronic Data Systems Corp., which offers a wide range of services, Poppel said. "When you're up against that kind of competition, you really don't stand a chance unless you affiliate with another company."

Fortunately for all parties involved, professional services acquisitions have to be conducted in a friendly fashion, noted Poppel.

"There is no such thing in this industry as a hostile takeover," he said. "We're talking about the quintessential firm whose assets are strictly its people. You aren't going to retain the management talent and the people skills if you attempt a hostile takeover."

(continued on page 10)

DG trims its force by 800, closes doors at two plants

Move expected to save the company $50m.

By Bob Brown
Senior Writer

WESTBOROUGH, Mass. — Data General Corp. recently said it will eliminate 800 jobs from its 15,600-person work force and shut down two plants to cut costs by $50 million per year.

The cutback will result in a $45 million write-off in the fourth quarter, which ended Sept. 24. Analysts said the retreat, which will probably result in a loss for the quarter, is a byproduct of the sluggish minicomputer market.

The majority of the layoffs will come from the closing of a manufacturing plant in Portsmouth, N.H., and a repair and parts distribution facility in Fountain, Colo., a company spokesman said.

The plant closing stems from DG's new strategy of buying more computer parts, such as circuit boards, instead of making them, according to the spokesman.

The repair plant in Colorado is being closed, the spokesman said, partially because the company's computers are becoming more reliable and need fewer repairs.

But Ronald Skates, executive vice-president and chief operating officer at DG, said, "We see ongoing and tough cost management as a way of life for Data General."

Despite the layoffs, the company plans to continue recruiting and hiring research and development, sales and customer support personnel, Skates said.

The cost cuts will not directly affect DG's communications systems group, but they should help the company run more efficiently overall, the spokesman noted.

DG has increased its networking focus in the past two years, as is illustrated by its plans to develop a digital backbone switch with Nippon Telephone & Telegraph Corp. in Japan, he said.

The spokesman also said the company plans to introduce a private branch exchange, but he declined to give further details about it.

DG, which unveiled additions to its proprietary line of MV computers last week, is currently supporting a two-pronged product strategy.

While expanding its proprietary MV systems, the company announced in April that it is also developing a computer family using Motorola Corp.'s new 88000 reduced instruction-set chips and the Unix operating system. New Unix-based computers are expected to be introduced sometime next year, analysts said.

"It is these industry-standard products that will plant Data General more firmly in networking markets because our computers will be able to communicate more easily with other vendors' computers," the spokesman said.

P. Martin Ressinger, a vice-president with Duff & Phelps, Inc., an investment research and financial consulting firm in Chicago, said DG's strategy to focus on industry standards could pay off. It should at least be more profitable than the company's strategy to produce lower priced and faster versions of Digital Equipment Corp.-type computers, he said.

In the first nine months of DG's fiscal year 1988, which ended June 25, DG's net income was $31.5 million on sales of $1.02 billion. In the first nine months of 1987, the company reported a loss of $104.4 million on sales of $942.1 million.

In an unrelated announcement, DG said it will receive a $35 million contract spread over five years to supply computers for France's new air traffic control system.

Fiber loop planned for Boston area

By Bob Brown
Senior Writer

BOSTON — Officials at Teleport Boston Corp. recently announced plans to build a 100-mile fiber-optic loop around the Boston metropolitan area starting early next year and a teleport facility in a suburb 20 miles west of here.

The triangular-shaped fiber loop will be accessible to about 60% of the offices located within the Boston metropolitan area and will provide users with an alternative to traditional local telephone company services, according to the company. New England Telephone & Telegraph Co. is the region's primary local carrier.

"As an area of tremendous growth, Boston must be prepared to meet the need for sophisticated global communications systems," said Teleport Boston President Bradley Youngman. "For too long, local communications users have relied on technically inferior copper cable and microwave technology for communications transmission."

Teleport Boston is the second company this year to announce plans to build an alternative fiber network in Boston.

In February, Teleport Communications-Boston, owned equally by Merrill Lynch Teleport Technologies, Inc. and Fidelity Investments, said it would build a 40-mile network linking sites in Boston's financial and business districts ("Merrill Lynch, Fidelity team for bypass net," *NW*, Feb. 29).

The new Teleport Boston proposal will provide service from carrier to carrier, end user to end user, and end user to carrier, said Youngman, who has worked on similar fiber networks in Chicago, Philadelphia and Washington, D.C. Such networks are proliferating throughout the U.S., he said.

The Boston-area network, which will be redundant to minimize downtime, will also give users access to a teleport facility the company is building to the west, probably in Framingham, Mass., some 20 miles from Boston.

The teleport will house five earth stations capable of transmitting and receiving voice, data and video worldwide. It will also provide users with an alternative to terrestrial long-haul carriers.

Construction of the network is slated for completion by 1991, with the first users coming aboard about a year after construction starts.

Several users have already signed letters of intent to join the network, but Teleport Boston officials said it was too early and would not identify them.

Mania takes on new territory

continued from page 9

According to John Frank, vice-president in charge of East Coast research at Input, a Mountain View, Calif.-based research firm, the number of professional services mergers can be attributed in part to shrinking hardware and software prices.

As hardware and software prices continue to fall, differences in value-added service offerings become more important criteria in the buying decision, he said.

A. Theodore Engkvist, president of Nynex Information Solutions Group, said his company's strategy is "to add on to our knowledge of telecommunications by the acquisition of companies that have software products and, of course, people skills."

In the wake of its acquisition of AGS Computers, Nynex will continue to pursue more professional services acquisitions, Engkvist said.

Such acquisitions promise to be well-received by users because few want to increase their communications staffs or extend deadlines to complete projects, he said.

Industry watchers agreed that acquisitions are good for the buyer, the seller and the user.

"An organization like Nynex, instead of simply being able to furnish a PBX and some data communications equipment, can now go in and fulfill the hype that they and others have been delivering for the past four years about total solutions," Poppel said. "No longer is it a hollow claim."

Users benefit, Poppel said, in that they can deal with a larger, established vendor instead of with an unproven start-up firm for their professional services needs.

According to Frank, vendors of communications products are offering professional services because users are playing a bigger role in the final configuration of their networks.

Congress protects vendors

continued from page 9

example, could dry up if the parts incorporate technology from a license that is pulled, the spokeswoman said.

George DeBakey, executive director of ADAPSO, the computer software and services industry association, said the legislation is important since "licensed technology is typically an integral part of an integrated software or computer service offering."

The legislation protects large and small companies alike by ensuring they will have access to critical technology in the event the licensor files for bankruptcy, DeBakey said. ADAPSO includes Boeing Computer Services Co. and Electronic Data Systems Corp. as members.

There has been no organized opposition to the bill, according to the Bankrupt Licensor Coalition, a group of vendors and trade groups that has been working for more than a year to get the bill developed and passed.

An oversight in revisions made to the Bankruptcy Code in 1978 is to blame for the existing endangerment of "industrywide technology licensing practices," the CBEMA spokeswoman said.

"Nobody foresaw technology licensing becoming common," she added. "But this bill is needed because there are a lot of small companies that invent technologies and end up bankrupt."

Netstar agrees to resell Contel VSAT equipment

By Bob Brown
Senior Writer

ROCKVILLE, Md. — Contel ASC recently signed a contract with Netstar AB, a Swedish telecommunications firm, to provide VSAT equipment that Netstar will sell in Scandinavia and parts of Europe.

Netstar will purchase from Contel ASC two master earth stations and an unspecified number of receive-only very small aperture terminals to be used in a variety of data applications for transmission of real-time information, such as stock quotes.

Netstar is a company within the nonregulated Teleinvest Group of the Swedish Telecommunications Administration, Sweden's government-controlled telecommunications agency. It will be Contel ASC's exclusive distributor in Sweden, Denmark, Finland, Norway and Iceland, and it could be one of several distributors to other parts of Europe.

The agreement is significant in that it demonstrates a willingness on the part of the Swedish telecommunications authority to encourage users to bypass the regulated network, said Thomas Jarne, Netstar's director of marketing, during a recent visit to the U.S. Because Netstar is unregulated, it can offer lower prices for its service, he said.

"People in the United States think of PTTs as being very conservative," Jarne said. "Americans would be surprised by Swedish Telecom. It's really taken the lead in being open-minded to new ideas, funding new services and actually deregulating itself."

Netstar will provide Ku-band service using Contel ASC's receive-only K-100 VSAT earth stations, which include a 30-in. antenna designed to receive data broadcast at up to 19.2K bit/sec.

Netstar, which was formed in January, tested the Contel ASC equipment in a 90-day pilot earlier this year.

In that test, financial information was carried from the Stockholm Stock Exchange via a leased line to a master earth station in Farsta, Sweden, outside Stockholm. It was then broadcast to sites in Sweden, Norway, Finland, Denmark, Luxembourg and the UK. Banks and investment firms were among the users that took advantage of the system, Jarne said.

> The agreement demonstrates a willingness on the part of the Swedish telecommunications authority to encourage users to bypass the regulated network.

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One of Netstar's goals is to expand its service to include private VSAT networks for users in the Nordic region, he added.

Contel ASC's equipment is currently installed for up-link broadcast services in several countries, including Canada, Hong Kong and Australia.

TELECOMMUNICATIONS

CARRIER SERVICES, CENTREX, CPE, WIRING SYSTEMS AND BYPASS

Worth Noting

The United Services Automobile Association, an automobile and homeowners insurance company, recently purchased five digital private branch exchanges from Intecom, Inc., which beat out AT&T, Southwestern Bell Telephone Co.'s equipment sales company and IBM/Rolm Systems Division for the contract.

Carrier Watch

Diginet Communications, Inc. of Milwaukee has announced it is merging with **FiberConnect of Chicago, Inc.** to provide local access services in the greater Chicago metropolitan area. The new company will retain the Diginet name. FiberConnect will become the marketing division for the firm.

Under the terms of the merger, FiberConnect will help Diginet expand its existing fiber net serving the Chicago business district. FiberConnect will also help construct and operate fiber nets in Oak Brook, Oakbrook Terrace, Northbrook and Arlington Heights, Ill. FiberConnect will market Diginet's Chicago network and the new suburban networks.

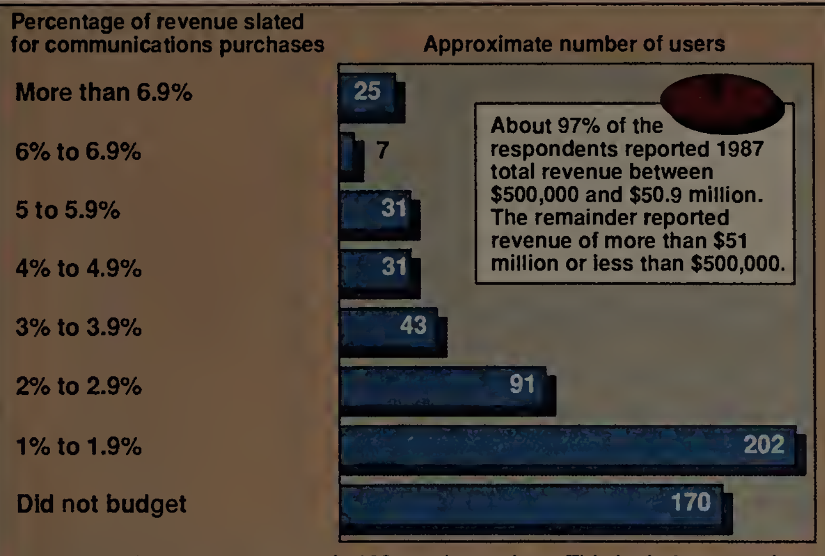
Diginet, which has operated a fiber network in the Chicago Loop, or business district, since June 1985, has already begun its expansion.

Bay Area Teleport of Alameda, Calif., last week began operating a 2.5-mile fiber-optic network serving businesses along San Francisco's Market Street.

The fiber network provides businesses in that area direct access to national and international long-distance carriers' points of presence in San Francisco.

(continued on page 14)

Communications budget breakdown



Figures are based on 600 users' 1988 purchase plans. This includes spending on telecommunications hardware, computer software and hardware, facsimile machines, printers, copiers and scanners.

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: THE YANKEE GROUP, BOSTON

PacBell to provide service with net mgmt. features

Digital data offering can support high speeds.

By Anita Taff
Senior Correspondent, Washington

SAN DIEGO — Pacific Bell recently announced it is seeking regulatory approval to enhance its family of digital data services by adding a service that sports new transmission speeds and three network management capabilities.

The service, to be marketed under the name Advanced Digital Network (ADN), adds support for 19.2K, 32K, 38.4K and 64K bit/sec speeds. Pacific Bell already offers services that operate at speeds of 2,400, 4.8K, 9.6K and 56K bit/sec.

New net management capabilities available through ADN are network control and diagnostics, selectable speed ranges and network reconfiguration.

The capabilities to be offered through ADN will primarily benefit midsize companies that need more sophisticated digital services but do not have the demand to justify T-1 links, according to Judy Bradford, director of transport services product development at Pacific Bell.

Because ADN will be offered within and between local access and transport areas, Pacific Bell must receive approval from the California Public Utility Commission and the Federal Communications Commission before offering the service. Bradford said the company expects regulators to approve the service by the first quarter of 1989. Pricing has not yet been established.

Pacific Bell will offer the service by adding new interface equipment and software to D4 channel banks in its central offices. Customers will need digital data service units that support the new speeds in order to link their customer premises equipment to the ADN lines.

The equipment and software was developed by Verilink Corp., although Pacific Bell holds patents for the ADN technology.

Initially, Verilink will supply all the central office and customer premises equipment. However, Pacific Bell is seeking other manufacturers to produce the new components as well. In November, the company will meet with other companies interested in licensing the ADN technology. Pacific Bell would not release details on the licensing fees.

Pacific Bell is seeking additional manufacturers for ADN equipment so that users will be able to obtain equipment from more than one source, Bradford said. But she also acknowledged that multiple vendors may aid the company in regulatory areas as well.

Regulatory concern

Restrictions contained in the Modified Final Judgment currently prohibit the regional Bell holding companies from directing the design or fabrication of equipment, even by a third party. It has been widely debated whether software development would fall under this restriction.

U.S. District Court Judge Harold Greene, who oversees the Modified Final Judgment, has expressed concern that the RBHCs, if allowed to manufacture, could specify network enhancements based exclusively on their own equipment, thereby shutting out any competition.

"Pacific Bell is opening its licensing to as many vendors as want to participate, in the spirit of meeting the Modified Final Judgment," Bradford said.

ACD software, PBX gear debut at TCA

Mitel product offers link to ACD Telemarketer; Memorex Telex package runs on 1285 micro.

By Jim Brown
New Products Editor

SAN DIEGO — Targeting the group's core membership of telecommunications managers, vendors at the recent Tele-Communications Association, Inc. (TCA) Annual Conference here unveiled switch expansion products and automatic call distributors (ACD).

Mitel Corp., of Boca Raton, Fla., released software called Generic 1003 for its SX-200 digital private branch exchange that doubles the line capacity of the switch from 336 to 672 lines and supports a T-1 trunk interface, which was also announced at the show.

The new system software also supports an extension to Mitel's ACD application, called ACD Telemarketer.

Like all ACDs, Mitel's ACD Telemarketer software answers incoming calls and forwards them to available telephone agents. If all agents are busy, the call is placed in a queue.

According to the company, a special feature of the software will predict whether agents assigned to one group are available to answer incoming calls immediately or within a specified amount of time. If agents are not available immediately, those calls are passed to another agent group.

This predictive feature reduces the time callers wait before a call is answered. In some cases, calls initially assigned to one agent group are answered by agents in another group before the caller is placed in queue, a company spokesman said.

ACD Telemarketer customers must use Mitel's Superset 4 telephones to support ACD functions. Superset 4 telephones feature an LCD screen that enables agents and agent supervisors to exchange data messages while the call is being answered.

Agents can use the message feature to ask a supervisor to monitor the call or to render help in answering a caller's question. This feature also enables the su-

(continued on page 14)

WASHINGTON UPDATE

BY ANITA TAFF

FCC waives CEI for New England Telephone. The Federal Communications Commission waived its Comparably Efficient Interconnection (CEI) requirement last week for New England Telephone and Telegraph Co. when it gave the carrier permission to offer protocol processing as part of a four-month videotex gateway trial in Vermont. Bell operating companies usually must file a CEI plan to offer enhanced services or to offer services through an unregulated subsidiary.

A number of parties, including MCI Communications Corp. and the American Newspaper Association, had opposed New England Telephone's request to conduct the trial without filing a CEI plan. MCI expressed fears that allowing BOCs to offer enhanced services without "minimal CEI safeguards" could hamper efforts to implement the more comprehensive Open Network Architecture rules. The American Newspaper Association questioned New England Telephone's motives, particularly whether the BOC intended to conduct a brief technical trial or construct an operational system to give itself a head start.

Despite the objections, the FCC ruled that waiving the CEI requirement was appropriate because New England Telephone has stated it will implement safeguards such as cost accounting and restriction of customer proprietary network information.

MCI builds fast fiber link for L.A. MCI Communications Corp. has cut over a 77-mile fiber-optic link in the Los Angeles area that transmits at 1.8G bit/sec. The high-speed segment provides voice and data services for customers located between Palmdale and Rialto, Calif., two suburbs of Los Angeles. MCI intends to upgrade several network segments currently operating at 405M bit/sec next year as facilities begin to reach maximum capacity, according to an MCI spokesman.

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HEWLETT
PACKARD

ACD software, PBX gear debut at TCA

continued from page 11

pervisor to send a message informing the agent that the call is being monitored.

The message screen also alerts agents assigned to one group when they are answering calls transferred to them from another group. This feature complements the predictive routing feature.

Agents can also push a button that makes the Superset 4 appear busy to the PBX. This enables an agent to leave the agent position without worrying that calls will go unanswered.

Superset 4 can also be configured to appear busy to the PBX for a specified time after the agent has hung up from a call. This enables the agent to finish paperwork or enter data on a terminal before answering the next call.

ACD Telemarketer also supports real-time monitoring that enables supervisors to determine which agents are currently busy, how many calls are in queue and other ACD management information.

Supervisors access the information via a Digital Equipment Corp. VT-100 terminal linked to the switch via an RS-232 data port.

Memorex Telex

Memorex Telex Corp.'s Systems Division Telephony Operations, of Camarillo, Calif., also announced ACD enhancements at the TCA show.

The company's new ACD Management Information System is software that runs on a Memorex Telex 1285 Unix-based microcomputer and can be used to manage a Memorex Telex 1001 PBX running its ACD Release 7.1 software.

The Memorex Telex 1285's color monitor displays real-time ACD activity, including the number of incoming calls, calls in queue, calls ringing and calls answered by agents. The ACD Management Information System will be coupled with ACD Release 7.1 software and will range in price from $1,000 to $1,500 per agent. The package will be available in the first quarter of 1989.

Memorex Telex also announced its 1001XL PBX, which supports up to 8,192 lines. Slated to be available in the second quarter of 1989, the 1001XL will enable users to expand the capacity of the 3,072-port 1001VL, the company's previous high-end model.

Switches can be upgraded to the 8,192-port limit of the 1001XL by connecting a Second-Level Matrix Module via a fiber-optic cable to the main switch. The 1001XL can also act as a single system providing links between local 1001VLs, and it can enable users to link smaller 1001 models distributed throughout a campus environment.

Memorex Telex also announced the Universal Digital Trunk Interface, a T-1 interface that supports the Integrated Services Digital Network Primary Rate Interface.

Toshiba America

Toshiba America, Inc.'s Telecommunication Systems Division, based in Irvine, Calif., used the TCA show to announce that its Perception II PBX will now support up to 64 trunks and 240 telephones, double the capacity of existing systems.

The extra capacity is supported by an expansion cabinet added to a base Perception II.

Toshiba America also announced a voice-messaging system, dubbed Intouch, that supports automated attendant features.

Slated for November release, Intouch ranges in size from four to eight ports. Pricing for the product has not yet been set, a company spokesman said.

The desktop or wall-mounted unit can be integrated with Toshiba America PBXs, enabling Intouch to light message-waiting lights on attached telephones.

The system can also be interfaced to other vendors' telephone systems, but it will not support advanced features in this configuration.

Intouch's automated attendant feature answers calls with voice prompts that ask callers with push-button phones to enter the extension of the called party or a digit that corresponds to the department being called. Callers from rotary phones are asked to wait for an operator.

If the extension being called is busy or the user has forwarded the phone to Intouch, the call is answered with a personalized greeting instructing callers to leave a voice message.

Carrier Watch

continued from page 11

The network also marks the beginning of Bay Area Teleport's plans to run fiber throughout San Francisco's financial district and down the San Francisco peninsula. The peninsula fiber run will link the city to Burlingame, San Mateo, Palo Alto, Mountain View, Sunnyvale and San Jose, Calif.

The fiber is scheduled to be cut over in the fourth quarter of 1989.

The San Francisco fiber network is linked to Bay Area Teleport's microwave network east of the San Francisco Bay. That network serves more than 20 sites in Northern California, including Sacramento, Oakland and San Jose.

Ericsson, Inc. of Richardson, Texas, has been awarded $36.9 million worth of contracts to supply **Los Angeles Cellular Telephone Co.** and **Cellular One** in Chicago with equipment they will use to expand their cellular networks.

Los Angeles Cellular, founded in March 1987, will add radio base station equipment and a second Ericsson AXE mobile telephone switch to its network, an Ericsson spokesman said.

In Chicago, Cellular One will add a second complete switching center to handle current and planned network traffic, Ericsson said. Cellular One began operations in January 1985.

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DATA COMMUNICATIONS

PRODUCTS, SERVICES, ARCHITECTURES, STANDARDS AND NETWORK MANAGEMENT

Worth Noting

The University of Tennessee Space Institute (UTSI) in Tullahoma, Tenn., has developed a tiny solar-powered radio transmitter that will be used to track migrating bald eagles from a space satellite. UTSI officials said the device could also be used to track trucks, railroad cars or even prison parolees on work release programs.

Data Packets

Tymnet, McDonnell Douglas Network Systems Co. recently announced a service for connecting personal computers to IBM mainframes over Tymnet's public packet-switched network.

The Async-To-3270 XE (Extended Edition) service lets IBM Personal Computers, Personal System/2s and compatibles access mainframes without using host-based software, protocol converters or synchronous personal computer interfaces.

Users access mainframes via the new Tymnet78 terminal-emulation software that runs on their personal computer.

Tymnet78 provides local-echo, full-screen editing capabilities, 3270-style keyboard mapping and screen flashes, as well as 3279 four-color screen support and 3278 printer support.

Steve Kim, Tymnet's senior product manager for IBM connectivity, said Tymnet78 gives users the look and feel of a 3270 device at a significant savings by utilizing the asynchronous communications port of their personal computers.

Async-To-3270 XE costs $300 per month plus an hourly, character-based charge.

Tymnet is a public data net owned and operated by Tymnet, McDonnell Douglas. ◼

Data Switch, DCA roll out net management offerings

New products work with other vendors' wares.

By Paul Desmond
Staff Writer

SAN DIEGO — Network management systems took center stage at the recent Telecommunications Association, Inc. (TCA) Annual Conference, with Data Switch Corp. and Digital Communications Associates, Inc. (DCA) both unveiling systems that integrate management of other vendors' products.

DCA announced the first software release under its Open Network Management System (ONMS), a system it promises will be able to manage products from multiple vendors by supporting emerging Open Systems Interconnection standards.

Data Switch offered its TotalNet system, which displays alerts from and interacts with other vendors' network monitoring systems. TotalNet also converts messages into an IBM NetView- or Cincom Systems, Inc. Net/Master-compatible format.

Release 1.0 of DCA's ONMS software will give users the ability to manage an array of DCA equipment in a T-1 backbone network from a single location as well as allow an interface to IBM's NetView network management system. Subsequent releases will include the ability to communicate with AT&T's Unified Network Management Architecture, Digital Equipment Corp.'s Enterprise Management Architecture and other specifications emerging from the OSI Network Management Forum, according to Bob Boykin, vice-president of marketing for DCA's Network Communications Group.

DCA users will be able to use ONMS Release 1.0 to manage their System 9000 T-1 networks and exchange information with other DCA devices in a T-1 backbone. Those devices include intelligent channel service units (CSU), Series 7000 T-1 multiplexers, Series 300 network processors, LanNet gateways and servers, X.25 packet assembler/disassemblers and statistical multiplexers.

Prior to ONMS, DCA users could manage only their System 9000 T-1 multiplexers from a Sun Microsystems, Inc. 3/60 workstation. Other nodes were managed on an individual basis.

DCA will provide for the exchange of information between separate network management

(continued on page 16)

Atex unit speeds Olympic news photos to presses

By Wayne Eckerson
Staff Writer

MOUNTAIN VIEW, Calif. — Photographers at the Olympic Games in Seoul, Korea, delivered high-quality, ready-for-press color photographs within 30 minutes after an event to American and British newspapers using a new network technology developed by Boston-based Atex Corp.

Unveiled in Seoul, Atex's Electronic Pre-Press Color Image Capture and Transmission Program enabled more than 500 photographers to transmit high-quality electronic copies of their photographs eight times faster than they could at the 1988 Winter Olympics.

"The Olympics were a good way to show off our technology, which I believe will soon become widely adopted by the media," said Peter Wood, vice-president of imaging operations at Atex.

The Atex system consists of Sun Microsystems, Inc. workstations that, outfitted with Atex software, can be used to store, send and retrieve digital images of color photographs across satellite links to other Sun workstations.

Unlike the wire services, which transmit color images over analog phone lines, Atex transmits color images digitally over satellite links. According to Wood, transmitting color images across analog lines takes more time and yields lower quality images than Atex's digital format.

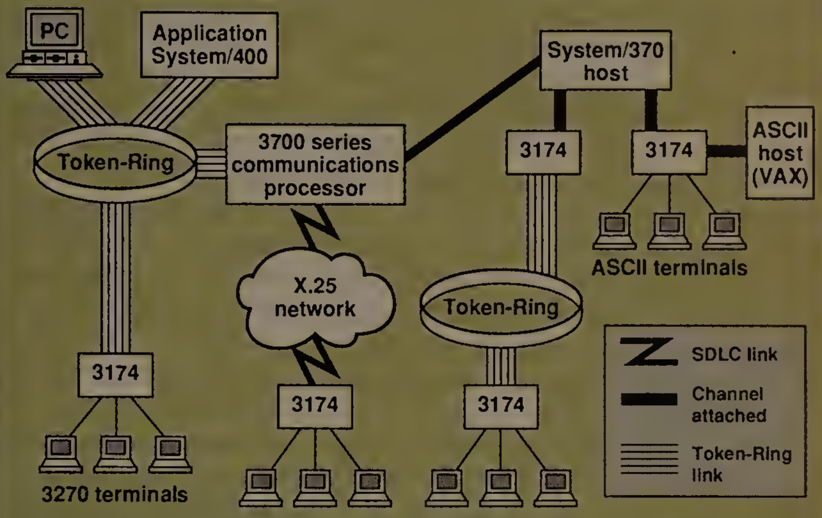
"What we've done is produce the same quality color image from a remote location that newspapers get when they process photographs on-site," Wood said.

The Olympic Games represent the first time Atex has set up the program in a commercial setting. Atex officials anticipate that they will work this fall with interested companies that want to customize the Atex program for their own use.

Wood said that most publishing companies have $200,000 color scanners, which they use to make press-ready film at their main plant. The scanners are too large to transport, making it diffi-

(continued on page 16)

IBM 3174 controller a key element in SNA networks



Billed by IBM as the "establishment controller," the 3174 works as a server or a gateway into both SNA and non-SNA environments.

SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS.
GRAPHIC BY SUSAN J. CHAMPENY

Users slow to spot IBM 3174 potential

IDC study discovers most companies use the cluster controller only to support 3270 devices.

By John Cox
Senior Editor

FRAMINGHAM, Mass. — Users have hardly begun to exploit the potential of the IBM 3174 cluster controller, according to a recent study by International Data Corp.

The study found that most corporations simply use the 3174 as if it were an older controller — to support 3270-type terminals and printers. Largely unused, but being widely tested, are the various connection options IBM made available with the 3174, including local network interfaces and links to non-IBM environments.

Yet those options are the key to the 3174's intended role as IBM's "establishment controller," a device that will attach smart terminals and workstations to Systems Network Architecture hosts via IBM's Token-Ring Network, according to one of the authors of the study.

Despite the controller's networking potential, most 3174 buyers are using the machine in its traditional role, according to Leslie Lord, senior analyst for connectivity with IDC, a market research firm located here.

Some 20% of the installed base of controllers have been replaced with the newest IBM controller or plug-compatible controllers from rivals, Lord said. But few customers have opted for such pricey connectivity options as the Token-Ring interface and the Asynchronous Emulation Adapter (AEA), which enables ASCII terminals to access IBM hosts and 3270s to access ASCII processors.

Customers are buying a few Token-Ring interfaces to test the option, which Lord and others said they expect eventually to replace what is now the most common way of linking displays to a mainframe: dedicated coaxial cable. "But very few corporations have made strong commitments to use the 3174 as the gateway between mainframes and the Token-Ring," she added.

William Conklin, IBM's manager of subsystem design and planning for the 3174, described the controller line's development as evolutionary. But he agreed that the 3174 represents a marked change in the way displays are managed in SNA nets compared with the original 3271 controller. The 3271 was introduced in 1971, when there was "no such thing" as a microcomputer, he said.

Until the early 1980s, most of a terminal's functionality was found in the controller itself, he explained. But as terminals were packed with memory, local processing power and graphics features, they took over some controller functions themselves. They also required new capabilities from the controller, such as higher bandwidth and the ability to support peer-to-peer communications, Conklin said.

One of the things IBM did in the early 1980s to accommodate some of the changes was to add the ability to update terminal microcode from the controller.

The 3174 continued the evolution by giving corporate users a variety of ways to connect displays with the host-based SNA nets, Conklin explained. Those options include coaxial cable, unshielded twisted pair, the IBM Cabling System, an X.25 interface,

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Data Switch, DCA roll out offerings

continued from page 15

applications using the Common Management Information Protocol (CMIP) of the International Standards Organization as it exists today. CMIP will evolve with OSI standards, Boykin said.

Each network node being managed under ONMS has an Agent Management Module (AMM), which is software that speaks the native language of that device, Boykin said. The AMM translates that native language into CMIP.

The Sun workstation's color graphics and windowing features, combined with ONMS, let users identify and correct problems on any network node and view the entire network, a single line card or any portion in between.

Data Switch achieves similar results from its IBM Personal System/2-based TotalNet.

Michael Fitzpatrick, a Data Switch vice-president, said TotalNet can display alerts from and interact with either single-purpose control systems, such as modem or multiplexer management products, or network monitoring and switch control systems.

TotalNet uses software running on the Personal System/2 to convert alarms from other vendors' net management systems into the IBM Network Management Vector Transport format used by NetView, Fitzpatrick said. Thus it can pass non-IBM alert messages to NetView.

Through TotalNet's 3279 session capability, the alerts can then be viewed from one or more terminals, depending on user requirements.

Both ONMS and TotalNet allow users to reconfigure the network from a central workstation. Both also filter and prioritize alerts so that a single problem, such as a downed line, does not display multiple alerts from each piece of the network affected by the problem.

DCA's ONMS Release 1.0 software, which will begin shipping in the first quarter next year, has a base price of $41,000, which includes an AMM for a System 9000 and a CSU.

TotalNet is scheduled to begin shipping next April. A configuration with four operator workstations and capability to manage 12 control systems will be priced at $148,000.

DCA also announced an entry-level Apple Computer, Inc. Macintosh-based T-1 network management system. The MacNMS is capable of configuring, monitoring, controlling and diagnosing a network of up to five System 9000 T-1 multiplexers.

Two views of the network are available at any time. One view gives a total network representation, while the other lets a network manager view a particular portion of the network down to a single circuit simply by clicking on that portion with the mouse.

The MacNMS will also ship in the first quarter of next year.

The software requires a Macintosh Plus or SE with 2M bytes of random-access memory and an internal or external small computer systems interface disk with a minimum capacity of 20M bytes. A system that will support five T-1 nodes sells for $7,560.

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Users slow to spot IBM 3174 potential

continued from page 15

the AEA for attaching ASCII devices and the Token-Ring interface.

The latter option enables customers to begin to replace dedicated coaxial cable with local network connections for terminals and workstations, creating a "high-speed pipe for transmitting . . . SNA packets," according to the IDC report.

Up to 32 existing coaxial cables can be attached to a 3174 that is attached to a Token-Ring. This, in turn, also supports a CPU. Or a Token-Ring with up to 140 devices can be attached to a 3174, which then links to a front-end processor, Conklin explained.

"What they're not promoting is a PC-based gateway," Lord pointed out. Companies like Novell, Inc. offer local network gateways based on personal computers, which is a cheaper alternative to the 3174, she said.

Besides being less expensive, microcomputer-based gateways require only one SNA address for the gateway itself, whereas controller-based gateways require a network address for each workstation, potentially adding a burden on host processing resources, Lord said.

While users familiar with microcomputers may prefer a microcomputer-based gateway, MIS departments, more familiar with the controller architecture, are more likely to favor the 3174.

The IDC report noted that IBM is touting the Token-Ring as the primary means for local SNA communications and plans to integrate Token-Ring with all its processing environments. In both of these moves, the 3174 is a key element, according to the report.

The multiple connection options that are the 3174's hallmark are expensive, Lord said, noting that they can easily double the cost of the base controller.

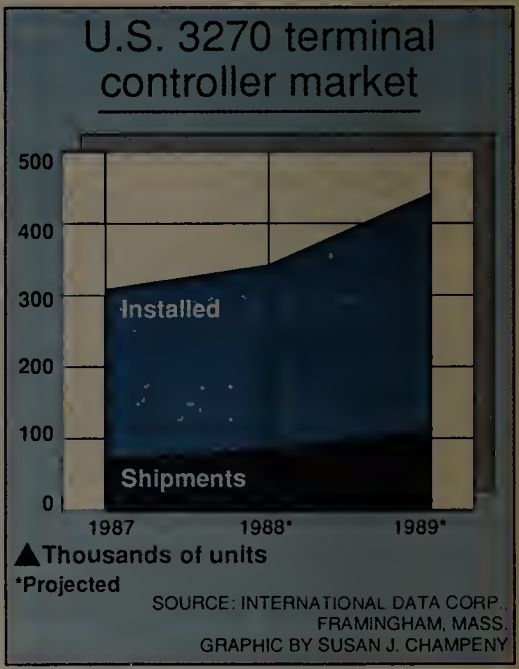
According to Conklin, prices for the coaxial version of the 3174 range from $3,500 to $10,000, with the channel-attached model reaching $13,000. An eight-port ASCII interface costs $2,300. A Token-Ring interface costs $5,250. Additional memory, which is highly dependent on the customer's configuration, is available in increments of ½M, 1M or 2M bytes, priced at about $1,350, $2,500 and $3,500, respectively.

IBM chose this pricing scheme so customers could decide how they wanted the 3174 configured, Conklin said. The alternative was to put all the features in the base model. "We chose to price all these options independently so the customer has to pay only for those they require. It's their choice, not ours," he said.

The 3174 provides a foundation for even more choices in the future. Lord speculated that IBM might eventually enable the 3174 to act as a router, allowing 3174s to pass traffic without involving a mainframe, as is now required. Such an arrangement would enable the controllers to shoulder some portion of the mainframe's processing burden, she said.

Conklin confirmed that such a capability could be provided if IBM enhanced the 3174 to be a PU 2.1 node, enabling it to communicate directly with other PU 2.1 controllers. IBM has not announced such support, and Conklin, citing company policy, declined to say if such support was planned.

But IBM has committed to implementing, in stages, another so-called peer-to-peer capability on the 3174 — support for LU 6.2, the IBM protocol that enables programs on different processors to communicate directly.



SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS.
GRAPHIC BY SUSAN J. CHAMPENY

IBM previously announced that the next release of the 3174 microcode, scheduled for the fourth quarter of 1988, will have an LU 6.2-based feature called Central Site Change Management (CSCM). CSCM software will enable site managers to distribute changes to 3174 microcode from a host via the network to the controllers, instead of manually distributing the changes on diskettes.

The IDC study said more advanced implementations of LU 6.2 could position the 3174 as a node for SNA Distribution Services, allowing the controller to handle storing and forwarding of messages across the network.

Atex unit speeds photos to presses

continued from page 15

cult to generate high-quality press-ready color photographs from locations outside the main plant.

The Atex program connects photo scanners in a remote location with color processors at the processing plant via the satellite link. Workstations at both sites do the job of storing, transmitting and receiving the images.

During the Olympics, the Color Image Capture and Transmission Program facilities were housed in Seoul, London and New York. At the main press center in Seoul, three Eikinox 1435 Slide Scanners transmitted digitized versions of color photographs to one of six Sun workstations. The workstation then reduced the size of the image, enabling photographs to be transmitted across the Public Satellite Network at efficient rates.

The electronic data traveled across the satellite network to Sun workstations in both the London offices of The Guardian newspaper and the New York offices of Advertising by Satellite Co. The workstations regenerated the pictures into display-ready form and then fed them into a Digital Equipment Corp. Design Master 8000 color processor. The regenerated and press-ready photo image was then transmitted by satellite to participating newspapers in the U.S. and Great Britain.

"The Olympics put our technology in contact with potential customers, like Reuters [Ltd.] and United Press International [Inc.]," Wood said. "I expect many publishing houses will show interest after the games are over."

LOCAL NETWORKING

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Worth Noting

"Ninety percent of all networked personal computers have been plugged together in order to share peripherals. That's all."

Peter Simon
Vice-president of marketing
Banyan Systems, Inc.
Westborough, Mass.

Netnotes

Crystal Point, Inc., a start-up supplier of asynchronous communications products for IBM Personal Computers and compatibles has introduced software for multiuser local-area net bulletin boards.

Called Yak, the software allows up to 16 users to be simultaneously logged on to a personal computer-based bulletin board using network or modem connections. This eliminates the message bottlenecks common to single-user bulletin boards, according to Christine Stephens, company founder and president.

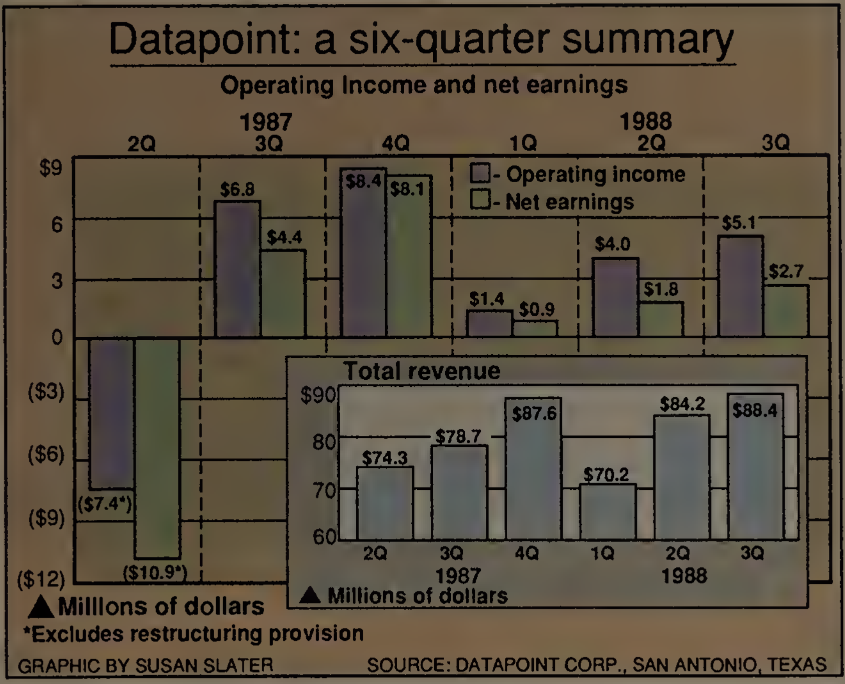
Yak users can read and enter both public and private messages. The program contains two default rooms designated "Lobby" and "Mail." When logging on to Yak, users are automatically placed in the Lobby, where they can leave public messages. From the Lobby, users can go to the Mail room, where private messages can be entered or read.

"The Mail room gives users complete confidentiality; messages are accessible only by the specific person addressed," Stephens said.

Yak is designed to run on a dedicated server. It is dBase III-compatible and requires PC-DOS Version 3.3 or higher and an IBM Personal Computer with a 20M-byte hard disk drive. It can be used with Network Basic I/O System, AT&T and other nets.

Yak costs $649 for a 16-port license and $399 for an eight-port license. The source code costs $250. Yak is available now.

For more information, contact Crystal Point at 12707 120th Ave. N.E., Suite 202, Kirkland, Wash. 98034, or call (206) 821-1909. ◻



GRAPHIC BY SUSAN SLATER SOURCE: DATAPOINT CORP., SAN ANTONIO, TEXAS

Datapoint banks on new execs, wares

CEO Potter reveals strategy to seek new life in network industry with revamped product line.

By Laura DiDio
Senior Editor

SAN ANTONIO, Texas — Since taking over as president and chief executive officer of Datapoint Corp. in June 1987, Robert Potter has been faced with the task of breathing new life into one of the industry's first networking companies.

In accordance with that charter, Potter has reorganized the company and revamped its product portfolio. Now Potter said he has to remind the networking world that Datapoint exists, and he intends to sell users on the merits of the recently announced Datalan local network operating system.

Robert Potter

The past 17 months have been an uphill struggle, Potter admitted. But he said he is hopeful that with six successive, profitable quarters behind the company and new products based on industry standards, Datapoint will finally be able to see the top of the hill.

In a recent interview with *Network World*, Potter and Don Bynum, Datapoint's new vice-president and worldwide marketing manager, spoke frankly about the company's woes over the last several years.

"The first thing I did when I joined Datapoint was unlock the front door. The second thing I did was make sure there were enough operators to answer the telephones," Potter said.

Potter is only half kidding. "Half the front door was open. Unlocking the other half was a symbolic move that made it easier for people to get in or out," Potter said. "One of the biggest problems was that, from both an engineering and marketing point of view, Datapoint had become introverted."

After introducing the industry to local networking through its Arcnet product line, the 15-year-old firm watched other firms walk away with the market. The company, Potter said, disappeared from trade shows for several years and significantly reduced its worldwide sales force and advertising campaigns.

Further, according to an analyst who requested anonymity, Datapoint kept Arcnet proprietary for too long and it was all but forgotten after the IEEE 802.3 Ethernet standard hit the market.

Asher Edelman took over control of the company in March 1985 in a hostile takeover. Edelman is Datapoint's current chairman of the board, and the Edelman Group owns between 5% and 10% of the stock. In his search for a new CEO, Edelman found Potter at Northern Telecom, Inc. Potter

(continued on page 20)

Banyan unveils two-year product, marketing plan

Strategy stresses 3rd-party pacts, world marts.

By Laura DiDio
Senior Editor

BOSTON — Banyan Systems, Inc. founder and Chief Executive Officer David Mahoney said last week the company has embarked on a two-year plan that will see a spate of new product introductions, several strategic alliances and a concerted effort to penetrate the European, Asian and Australian markets.

Speaking at the company's first Networking Technology Conference, held both here and in Santa Clara, Calif., Mahoney said Banyan will no longer be known as "the quiet networking company."

Its new 12-point initiative will help the Westborough, Mass.-based firm achieve annual revenue of more than $100 million in 1989, he said. Additionally, the plan calls for Banyan to reach the $500 million revenue mark within the next three to five years.

Mahoney and other Banyan executives, including company President Richard Miese and Vice-President of Marketing Peter Simon, declined to divulge specifics about either the upcoming products or strategic alliances. But Mahoney and Miese reaffirmed that Banyan sees its position in the market as a supplier of large local networks supporting 100 nodes or more.

"Connectivity was once the entire issue in the LAN industry; today it's merely the tip of the iceberg," Simon said. As such, it is Banyan's intention to focus on the integration and internetworking of heterogeneous local networks, rather than simply connecting nodes on the same personal computer network.

"In the corporate world, they need solutions that don't expire when the seventh or eighth user hops on the PC LAN. Users need a PC-only solution that won't lapse into some form of technological senility when asked to converse with a more cerebral mid-range system," Simon said.

In answer to critics who view its VINES Unix-based operating system as proprietary, James All-

(continued on page 20)

LANMARKS

BY MICHAEL DURR

As networking evolves, focus turns to reliability

For years, computer reliability has been focused around the concept of the "critical application." A critical application was usually a big, heavily used system such as an airline reservation system, a bank's transaction-processing system or a military application. If users had one of these systems, reliability was a factor in their purchasing decisions. Most other users, though, simply bought good computer products and made sure they backed up their data.

The latter approach was practical when every CPU was carefully managed by a data processing professional and when enhancing a system's reliability was a costly decision.

Today, however, the situation is different. The number of CPUs in systems has increased by thousands, while the number of DP professionals has often remained static. And the idea of a few critical applications is becoming obsolete as new, more accessible computers are fully integrated into business operations.

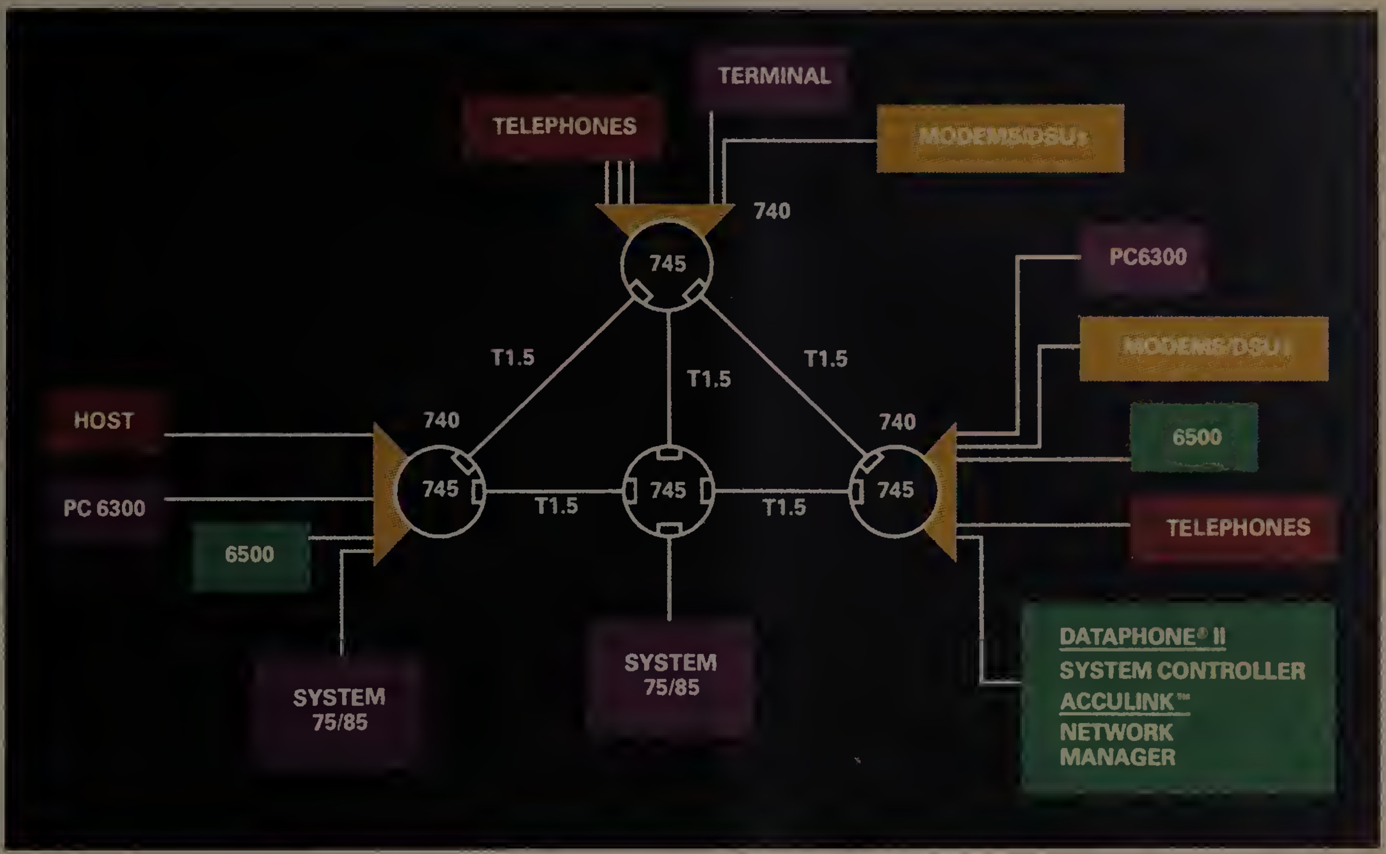
Reduced management control and increased dependence on computers and local networks have placed greater significance on system and network reliability. Not all organizations require the same level of reliability, but every organization should analyze its need and weigh that against the cost of protection. Fortunately, system and network reliability have become much more cost-effective.

Local-area networks provide a good example of how low-cost reliability can be added to systems. The modular design of local-area networks permits reliability to be added wherever it's needed and to whatever degree it's required.

(continued on page 20)

Durr is director of corporate marketing for Novell, Inc. in Provo, Utah.

"I know there's a bug in our T-1 Network. So how can all six of our vendors tell me their equipment 'checks out fine'?"



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Air Force awards ULANA contract to TRW and EDS

Program calls for installation of TCP/IP networks.

By Laura DiDio
Senior Editor

WASHINGTON, D.C. — The U.S. Air Force recently awarded its Unified Local Area Network Architecture (ULANA) contract to TRW, Inc.'s Information Networks Division and Electronic Data Systems Corp. (EDS).

The ULANA program calls for the installation of Ethernet Transmission Control Protocol/Internet Protocol local networks — including all hardware, software, installation, training service and maintenance — at more than 100 Air Force bases in the U.S.

The seven-year ULANA contract is worth a total of about $150 million, making it the largest network contract ever awarded by the Air Force, according to an agency spokesman.

The contract is divided into two parts. The first portion specifies an Air Force Electronics Systems Division (ESD) contract for qualification testing of local network equipment. The second part calls for an "indefinite delivery/indefinite quantity" of local network products that will be tested by ESD in the qualification portion of the contract.

According to the Air Force spokesman, ULANA will use more than 200 different local net products that meet the IEEE 802.3 Ethernet standard and Department of Defense protocol suites, including TCP/IP and Telnet.

Ed Snyder, vice-president and general manager of TRW's Information Networks Division in Torrance, Calif., said the Air Force split the contract between TRW and EDS, based in Bethesda, Md., because the job is too big for one company.

"The Air Force decided to split the contract between us and EDS because the job is so big. It encompasses a standard group of about 80 products, including interface cards for host attachments, terminal servers, PC cards and network software," Snyder said. Additionally, he noted, the product offerings of both companies emphasize different features, even though they meet the same requirements.

"This gives each Air Force base the option of choosing between either EDS or TRW, based on particular features, but the minimum performance requirements are met by both," Snyder said.

TRW will supply most of its own networking products directly to the Air Force and use only a limited number of subcontractors, he said.

"We've integrated the LAN pieces into our own systems products, so we don't have to use very many local networking subcontractors," Snyder said.

"We do, however, already have OEM agreements with SynOptics [Communications, Inc.] for its twisted-pair wiring products and cisco Systems, Inc. for its gateway products. And three years ago, we did a source license for Bridge Communications' TCP/IP software for terminal servers, but Bridge is not a subcontractor on this contract," Snyder said.

Banyan unveils two-year plan

continued from page 17

chin, the company's vice-president of research and development, said, "Users of our systems never have to see Unix. We have built interfaces that allow Unix to run on top of MS-DOS, for instance, so they have all the functionality of Unix but it appears exactly as MS-DOS to the end user."

Allchin also said the Banyan version of Unix is optimized and fully compatible with AT&T's standard.

The company noted at the meeting that in the last several months, it has begun offering support for a variety of hardware and software standards. The Banyan executives pointed to recently announced support for the Transmission Control Protocol/Internet Protocol as well as support for Apple Computer, Inc.'s Macintosh and the Open Systems Interconnection model.

"When and if OS/2 and the LAN Manager reach the right volume dimensions, Banyan will support them too," Simon said. "If it's right, we will also support IBM's Systems Application Architecture, the [Application System]/400 and Digital's DECnet. But we will not act upon marketing hype."

In keeping with this strategy, Banyan will focus on nine specific product directions during the next 24 months, including a move to integrate support for the next generation of personal computers and more Unix-based devices. Additionally, according to Mahoney, the company will support a variety of application programming interfaces and other industry standards.

Users can also expect Banyan to announce distributed systems software products, a steady stream of directory services and smaller, more modular product sets, Mahoney said. This is an effort to offer both more affordable and more flexible options to companies that have all levels of networking requirements.

Another portion of Banyan's announcement dealt with the expansion of the firm's worldwide sales and marketing presence.

Until now, Banyan has limited its North American representation to major cities. Within the next two years, the company will have sales representatives in second-tier cities throughout the continent, effectively doubling its sales force, Mahoney said.

The company will also move to aggressively market its products in Asia, Australia and Japan. Earlier in the year, Banyan opened a subsidiary in the UK, its first in the European market.

To increase the amount of available software and peripherals that run on VINES, Banyan intends to secure a "select set of agreements with a handful of leading computer and third-party networking vendors," Mahoney said. He would not elaborate on the companies with which Banyan may or may not form partnerships. He did say, though, that discussions are ongoing with a number of vendors and that particular announcements will be made within six months.

Datapoint banks on new execs

continued from page 17

was a group vice-president and headed Northern Telecom's Integrated Office Systems Group.

When Potter came on board, the company had not been profitable for four years. He took the job because "it presented a challenge to take a company that had a heritage in local-area networking and turn it around."

It was a process that Edelman had already begun. As Potter recalled, "When I came in, the balance sheet was quite sound. Datapoint had already gone through a restructuring to rid itself of surplus inventory, facilities, overhead and machinery."

But there was still work to be done.

"The company had lost all momentum," Potter said. "I saw the product line needed to be overhauled, and we had to open ourselves up to the world. Now we're encouraging our users to propose that many of the proprietary systems — like Arcnet and Databus [the company's proprietary programming language] — be proposed as standards."

Joseph Seidler, vice-president of Infonetics, Inc., a consulting firm in Santa Clara, Calif., agreed. "As a company, Datapoint went the way of Arcnet: It always seemed to be yesterday's news. And that's too bad because the technology it developed for Arcnet was quite good."

Despite its low profile, Datapoint reported annual sales of $331 million in fiscal 1988, which ended July 30 (see chart on page 17). A good portion of those dollars came from international sales. The company has 2,800 employees and does business in 42 countries.

"Arcnet has an installed base that is much greater than people realize," Seidler said. "As a product and technology, it's always been a dependable workhorse. It just never captured the imagination of the networking masses."

Of the approximately one million Arcnet nodes installed, Potter estimated that Datapoint accounts for about 25% to 30%. The rest are derivatives made by companies that based their products on Arcnet chips.

Still, with a proprietary network in an industry that is embracing standards, Potter knows Datapoint cannot count on Arcnet sales alone to get back on the growth track.

Instead, the company is betting that a spate of OEM agreements, along with a recently introduced family of network servers and the new Datalan network operating system, will turn the tide.

Specifically, Datapoint now has several OEM relationships to resell products, such as Intel Corp. 80386-based personal computer servers, software, a Unix processor and large disk subsystems.

The 80386-based network servers were introduced last April and range in price from $10,000 to $200,000. "Our current strategy is to enable users to grow their networks by adding additional processors of varying sizes in response to their own business needs," Potter explained.

The company is positioning Datalan as a direct competitor to Novell, Inc.'s NetWare and is touting it as an industry standard.

Datalan runs on IBM Personal Computers and compatibles that utilize Network Basic I/O System software applications. It is compatible with Arcnet and can also run on Ethernet, token ring or any hardware for which NETBIOS software is available. It also supports Novell's record-locking protocols and features system fault tolerance.

The introductory $995 Datalan price tag is about 30% to 50% lower than Datapoint competitors, Potter said. The Datalan software to support four users sells for $595, an eight-user version costs $1,195, and a 225-user version costs $1,995.

"Pricing isn't the issue. It's the market presence that counts," Potter said. "The lower pricing is just one of the things we're doing to let people know that Datapoint is seriously back in the network competition, whether they have small networks of three nodes or large PC nets of 3,000 nodes."

Infonetics' Seidler, while impressed with the capabilities of Datalan and Datapoint's recent positive moves, said the company faces stiff competition in a market that is quickly maturing.

"Datapoint has a real fight on its hands. The market for network operating systems is maturing rapidly. Novell's NetWare has about a 50% market share, IBM has a solid 25% of the market, 3Com [Corp.]'s 3+ has a 10% to 15% market share, and Banyan [Systems, Inc.] has a 5% market share," Seidler said.

Also, he said, derivatives of Microsoft's OS/2 LAN Manager will probably gain market share.

"We know it won't be easy," Potter said. "But we're confident we've turned the corner."

Focus turns to reliability

continued from page 17

High reliability on a local-area network is the result of several complementary strategies that protect against specific threats. An uninterruptible power supply protects system hardware from damage caused by power fluctuations. A backup device with removable media protects old data and provides off-site storage capability.

Fault tolerance is a technology designed to protect current data and prevent system downtime. A system that can keep functioning even though one or more components fails is said to be fault-tolerant. Fault tolerance is implemented by adding redundant components to the system.

One type of fault tolerance is disk mirroring. A second hard disk storage device is added to the system and configured to receive all changes that occur on the primary disk. It becomes a mirror image of the primary disk. If the primary disk fails, the mirror disk is ready to take over. With the mirror disk, the system is partially fault-tolerant insofar as a disk can crash without causing any loss of data or system downtime.

Any component in the system can be made fault-tolerant, provided the system software can support the configuration. In practice, total redundancy is seldom justified. It's usually more practical to focus on areas that are most likely to fail. The most common hardware failures are disk-related. Dynamic disk management, duplicate directories, disk mirroring and disk duplexing all provide fault-tolerant protection for these risks.

Well over half of all system failures are caused by user error. These problems show up most seriously with data base-type applications, such as spreadsheets. If a user error causes a data base update to fail while it is in progress, the entire data base can be corrupted with the result that everyone on the network is affected. A fault-tolerant system that monitors updates and keeps a backup of the data base until the update is successfully completed can prevent data-base corruption.

Besides hardware, reliability is also heavily dependent on good network management software. For example, software should alert the system or network administrator about the frequency of data base update failure so that an unreliable application can be changed or a user retrained. It should also send an alert that an uninterruptible power supply has taken over or a disk has failed.

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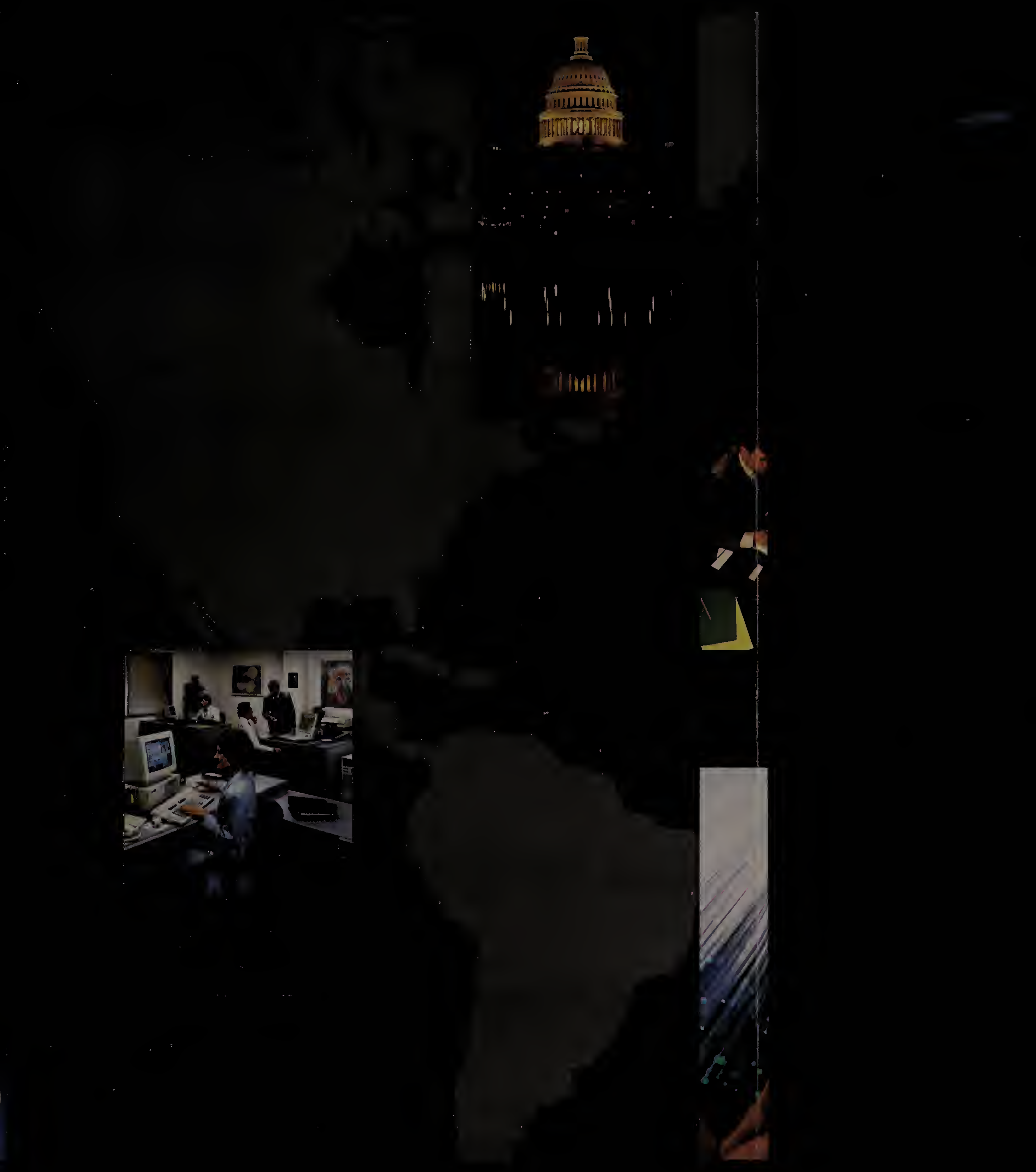

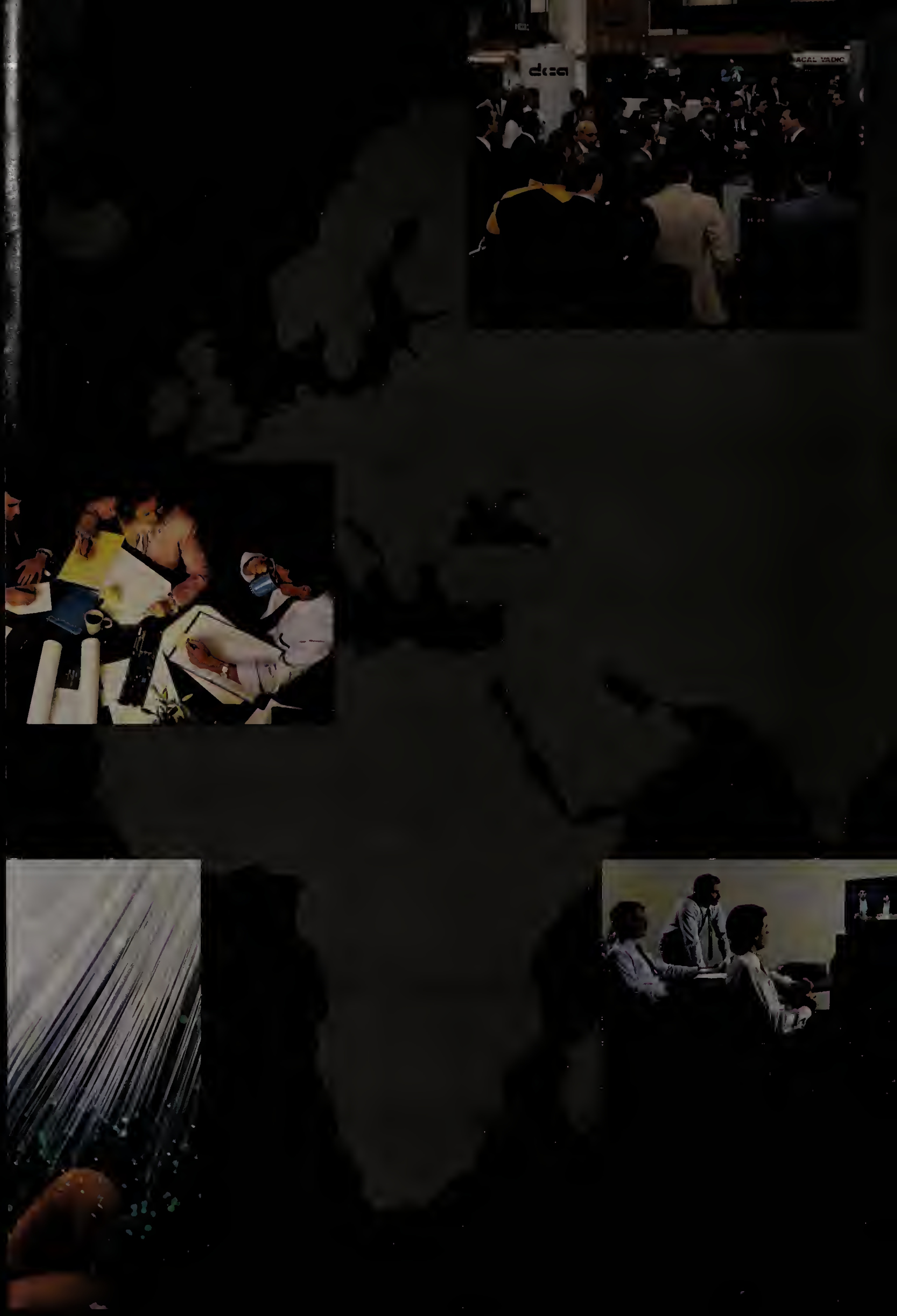
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MANAGEMENT STRATEGIES

MANAGING PEOPLE AND TECHNOLOGY: USERS GROUPS AND ASSOCIATIONS

Worth Noting

The American Institute, a Madison, N.J.-based technology education firm, is offering 20 $5,000 scholarships for its communications classes at sites around the country. The award lets an individual attend five minicourses. For more information, contact the institute.

Dialogue

In light of IBM's recent Open Systems Interconnection product announcements, do you feel it is committed to supporting the international networking standards or some variation?

"The announcements signal IBM's commitment to OSI. Most significantly, IBM said it will merge OSI protocols with its Systems Application Architecture. Just for IBM to talk about interoperability between systems is a significant advance.

"The announcements also signal that there will be two architectures in the future, Systems Network Architecture and OSI, and there will be communications between the two."

Bud Huber
Manager of advanced networking integration
Communications and Data Processing Division
Hughes Aircraft Co.
Long Beach, Calif.

"It is difficult to determine where IBM is going with OSI, because in the past it has made half-baked commitments to some product areas in order to cover the market. It often adopts a sit-back-and-wait attitude until it sees a real opportunity in the marketplace."

George Wyncott
Manager of IBM systems
Purdue University
Computing Center
West Lafayette, Ind.

"I don't think IBM is committed to OSI. It's being pushed into it because there are multiple vendors in every shop. It is providing OSI support only be-

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Bradlees' POS net assists with retail management

System also opens door to new technologies.

By Jim Brown
New Products Editor

BRAINTREE, Mass. — Bradlees, a chain of discount department stores headquartered here, recently completed the installation of a 168-store point-of-sale network that helps it track sales and inventory and lays the foundation for future advances in retail networking.

The company, for example, is already gearing up to test cash register scanners. This is part of a larger investigation into the possibility of using the POS network to automatically instruct warehouses when in-store inventories run low.

That investigation will eventually lead the company to explore the benefits of using electronic data interchange to exchange documents such as purchase orders with its suppliers.

Bradlees, a division of The Stop & Shop Companies, Inc., finished installing the underlying IBM 4680 POS network last June. Besides enabling the store to collect sales and inventory data, it helps curry favor with customers by speeding checkouts.

The 4680 system consists of cash register terminals linked to an in-store IBM Personal Computer AT acting as a controller via a serial loop network operating at up to 38.4K bit/sec. The controller compiles sales data into batch files and submits these files to an in-store IBM Series/1 minicomputer.

The Series/1 is linked to IBM 3090 and 3081 mainframes in Stop & Shop's Quincy, Mass., data center via an analog leased-line network. Those 9.6K bit/sec multidrop lines support IBM's Synchronous Data Link Control protocol and replace the dial-up links Bradlees once used to link headquarters to each store.

Headquarters personnel use the leased-line network each week to download sales prices for 8,000 to 10,000 items to the 4680 POS network controller. The controller automatically rings in the sale price when cashiers enter the stock keeping unit (SKU) number of marked down items. Otherwise, the cashier must manually enter the price, a process that can lead to mistakes.

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GUIDELINES

BY ERIC SCHMALL

Hiring process tips for telecom managers

The technical competence communications managers gain in managing networks doesn't always give them the skills necessary to recruit and hire competent employees. This is unfortunate since, ultimately, it is people, not technology, that comprise the most important asset of any organization.

By following a few simple guidelines, communications managers can improve their performance in the hiring process.

First, realize that job descriptions have depressingly short life spans. Communications managers make a mistake if they rely solely on old job descriptions to create new ones. Job responsibilities, like technology, change continually.

However, outdated job descriptions can be useful references. For instance, they can quickly give managers a list of educational and other background requirements they may want to include in a needs requirement.

Managers must then carefully evaluate the role the new hire should play in their organization. For instance, how much of a new hire's time will be spent doing routine tasks? How much time will be spent in specialized, highly skilled labor? All of this information has to be analyzed and assigned levels of appropriate importance.

After the preliminary work is complete, the search and interview process can begin. In the interview, a manager must evaluate a person's background and skills as they relate to the skills needed to perform the job. But unfortunately, the interview process in this field often focuses too much on

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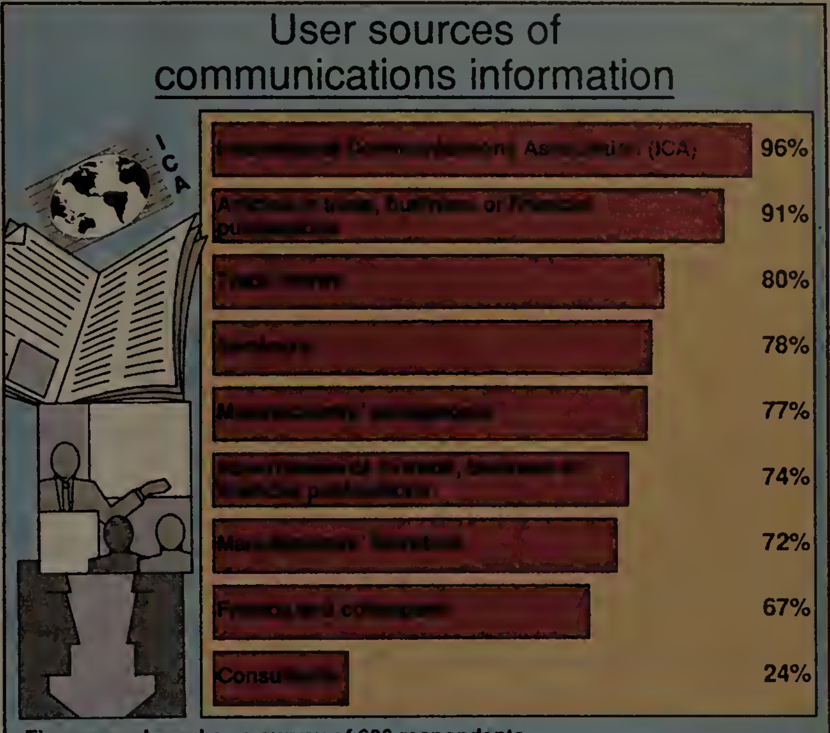
Schmall is network systems manager for an insurance holding company.


User sources of communications information

Figures are based on a survey of 600 respondents.
SOURCE: *WALL STREET JOURNAL* SURVEY OF ICA MEMBERS, NEW YORK
GRAPHIC BY SUSAN J. CHAMPENEY

Staying au courant crucial for net execs

Telecom managers find they must fight to keep up with the barrage of net-related information.

By Barton Crockett
Senior Writer

Network managers are finding it increasingly hard to stay informed.

The task is an important one. "If you ignore new developments in this industry, you play a game of chance with your future," said Roger McKinnon, director of telecommunications with the Philadelphia-based food services firm ARA Services, Inc.

And staying informed is a task that, ironically, becomes more difficult as network-related information proliferates.

"One of my biggest chores is sifting through all the publications and vendor literature I get in the mail," said Ruth Michalecki, director of telecommunications at the University of Nebraska in Lincoln. "These things pile up on my desk and in huge stacks on the floor."

"Now that line management is reading about things like ISDN in the general press," said McKinnon, "I've really got to stay on top of things. They are building perceptions and getting informed even before I get there. That means I've got to read what my managers are reading in addition to my own materials. It also means I can't snowball anyone on my pet projects."

Users generally find out about new developments through users groups and the press, according to a survey last spring of members of the International Communications Association (ICA) by the *The Wall Street Journal*. Ninety-six percent of the 600 respondents said they learn about developments in the communications industry from the ICA, and 91% of the respondents cited articles in trade, business or financial publications.

According to John Coston, director of marketing services with *The Wall Street Journal*, the results indicate a very close relationship in the industry among users, trade associations and the trade press.

"We survey a lot of industries," he said, "and few follow their trade organizations and press as closely."

Interestingly, consultants were near the bottom of the ICA members list, being cited by only 24% of the respondents. Some users said this result did not surprise them, since they feel they get better information about industry developments than consultants do.

"I get a lot of input very early from vendors under nondisclosure," said McKinnon. "I don't think vendors are as willing to give this information early on to consultants."

More than 70% of the respondents, in fact, said they rely on their vendor salesmen, advertising and literature for details about new developments.

Sixty-seven percent said they also look to friends and colleagues for information.

The upshot is, simply enough, that many users feel they cannot ignore any source of information.

Some users have developed ways to deal with the information glut. The University of Nebraska's

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Bradlees' net assists with management

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The leased-line network also transmits one-way electronic messages from headquarters to the stores concerning price changes, bad credit cards and the names of customers who have passed bad checks. Bradlees will install a two-way electronic-messaging system later this year, according to John Macklin, director of store operations.

Besides meeting in-house communications needs, the network provides a gateway to credit card authorization services used to validate Visa, MasterCard, American Express, Discover and Bradlees' own proprietary credit cards. Bradlees made its credit card available chainwide last year after rolling it out in the Philadelphia area in 1986.

When authorizing credit transactions, cashiers pass the credit card through an integral card reader on the 4680 terminal. The reader extracts account numbers from the card's magnetic strip, and the data and purchase amount are sent to an IBM 3725 front-end processor in Quincy.

The front end routes Visa, MasterCard, American Express and Discovery transactions via another leased line to National Bancard Corp. in Melville, N.Y. National Bancard has links to the Visa, MasterCard, American Express and Discover networks, which actually authorize the transactions.

Bradlees' own card transactions are sent from Quincy via leased line to the Citicorp Retail Services processing center, also in Melville, where the transaction is authorized.

Even though the Bradlees card has been available chainwide for only a year, it accounted for 8% of Bradlees' $2.2 billion in total sales last year. Credit purchases account for 32% of sales at Bradlees.

By capturing data every time a customer uses a Bradlees credit card, the company will be able to offer that customer incentives such as private sale notices and discounts on purchases.

While the leased-line network would support debit cards — which enable the merchant to deduct the amount of a purchase from the customer's bank account — Bradlees currently has no plans to accept them. "Debit cards have an application in a supermarket, but I'm not so sure they have a lot of application for the mass merchant," Macklin said.

Bradlees hopes to implement scanners chainwide by 1990.

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Network evolution

Although debit cards are not in the cards for Bradlees, the store chain wants to flesh out the POS network to support new capabilities. "We already use the network to transmit a lot of data, but we're going to be putting more applications on it," Macklin said. "We know the next thing we have to move to is scanning."

With a bar-code scanning system, items passed over an optical scanner at the checkout counter will initiate a price search on the store controller. The price is then automatically rung up at the register. The controller will list the price of every item in the store.

The scanning system would limit data-entry mistakes, giving Bradlees store managers more accurate information than they have today when ordering supplies from the warehouse.

Besides being more accurate, the scanners pave the way for the eventual automation of ordering supplies. Store managers today rely on printed sales and inventory reports generated using the in-store Series/1s.

By ensuring the accuracy of data entry at the cash register, the scanning system could make it possible to automatically send a merchandise order to the warehouse when goods run out, a process known as automatic replenishment.

"There are other things we want to do before we worry about automatic replenishment," Macklin said. "The first step is to improve the integrity of the data we're collecting."

The scanning system going into test mode at one of Bradlees' stores later this year is designed to do just that. Bradlees hopes to fully implement scanners chainwide by 1990. "If you have more, better and timely information," Macklin said, "you have to be able to do a better job of distributing goods to the stores."

Dialogue

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cause its customers are demanding it, and it doesn't want to lose market share."

Donald Higgins
Director of computer services
Florida Power Corp.
St. Petersburg, Fla.

“It's hard to tell. We're just going to wait and see what IBM delivers in terms of real products. We haven't spent time worrying about it."

Thomas Schroeder
Manager of data processing
and technical support systems
Pratt & Whitney Aircraft Division
United Technologies Corp.
Hartford, Conn.

“I think IBM's OSI products offer some advantages to the small network user who doesn't want to devote an entire machine to running the network. I don't see a great deal of advantage other than that."

Ron Young
Senior accountant
Pepsi-Cola/Dr. Pepper Co.
San Francisco

“Conformance to a particular OSI protocol suite doesn't require a manufacturer to change how its workstation or computer does things internally, but it states a recognized standard that the products will use in communicating externally to other intelligent open systems."

Richard Lefkin
Assistant vice-president, Citicorp
Chairman of Office Systems
Standards Committee
New York

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Staying au courant crucial for net execs

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Michalecki uses a computer program to help her organize the reams of trade publications scattered around her office.

"Basically, what I have here is a computer data base listing, by subject and author, articles from all of the trade pubs I get," she said.

Michalecki said the computer program was written by her son, who does computer consulting work. The data base contains references to 2½ years worth of articles in every major communications-related publication. The data is stored on the 5M-byte hard disk drive of her IBM-compatible personal computer.

Michalecki said she and some students at the university use the data base to look up articles in subjects that interest them. Users query the data base for stories by author or subject and the computer lists the publications and page numbers of relevant articles, with a brief summary. These articles can then be retrieved from files Michalecki keeps in her office.

Michalecki said a university student employed by her office worked two weeks, less than eight hours each day, to compile the data base.

She added that this student regularly updates the data base as new publications come in, which takes only "a few hours each month."

Michalecki said that anyone interested in learning more about or using this computer program should contact her at the university.

Hiring process tips for telecom managers

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technical abilities, as opposed to people skills.

Of course, one has to meet minimum technical requirements even to be considered. But the shortage of qualified people in the telecommunications industry has brought about myopia among interviewers. The joy of discovering a technically experienced person often overshadows other important considerations.

Chief among these concerns is the individual's personality. Will he or she fit in the organization? Many technically competent people have the social skills of a clam. This may be fine if the position requires the individual to work isolated from the rest of humanity. But such jobs, even in a technical profession like communications, are rare.

Ensuring the candidate will feel comfortable with the organization's culture is also crucial. Will the atmosphere allow the individual's talents to thrive? If not, could the candidate adapt? If he or she couldn't adapt, how will this affect the morale and performance of the rest of the group?

Leader or follower?

A final concern is how well the interviewee will get along with the manager's style of leadership. An authoritarian manager may not want to hire an outspoken, creative individual. A more participative management style, on the other hand, will not click well with a passive follower who needs constant supervision.

The interview process seems intuitively simple since most managers have spent a great deal of time getting interviewed themselves. Even so, it must be approached systematically, with great care and attention to detail, since selecting the right employees can spell success or failure for a communications organization.

PRODUCTS & SERVICES

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Worth Noting

See inside for:

- Modem from Lanex that lets Ethernet units operate on broadband coaxial cable
- DA Systems' support for iNet's E-mail service
- Ventel's error-correcting modems for IBM micros running OS/2

First Look

Micom enhances Box Type 3 X.25 access

Micom Systems, Inc. unveiled two software upgrades that enhance the ability of its Box Type 3 to access X.25 packet data networks.

The **Micom Box Type 3 Packet Switch (MB3-PSW)** software now features an extended gateway function that lets MB3 users bridge between X.25 networks without buying additional equipment. Contained in a Featurepak cartridge that inserts into the MB3, the software converts the MB3 into a packet switch for private X.25 networks or a remote node concentrator for public X.25 data networks.

Two of the 12 links the MB3-PSW supports can be configured for speeds up to 72K bit/sec. The high-speed version of the switch software, **MB3-PSW-HS,** can handle more than 100 128-byte packet/sec, while the standard version handles 50 128-byte packet/sec. Compliant with 1980 and 1984 CCITT X.25 recommendations, the software recently earned Defense Data Network certification.

Micom also released **3270 Bisynchronous PAD (3270 BSC PAD)** software, which can now support X.25 link speeds up to 72K bit/sec and has a built-in tester that checks the validity of the packet assembler/disassembler's configuration before connecting to the host computer.

Also contained in a Featurepak cartridge, the 3270 BSC PAD supports links between remote IBM or compatible cluster controllers and Binary Synchronous Communications host computers over

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Tekelec airs protocol analyzers

By Wayne Eckerson
Staff Writer

SAN DIEGO, Calif. — Tekelec, a manufacturer of data communications test equipment, unveiled a series of protocol analyzers at the recent Telecommunications Association, Inc. Annual Conference here.

The new products, which will be available by the fourth quarter of 1988, include the Chameleon 8000, Chameleon 20-P, Chameleon 20-I and DS3 Option for the TE820A DS1 Test System.

The Chameleon 8000 is a 20-lb portable test unit that can be used to monitor and diagnose T-1 lines and equipment as well as the DS0 channels within T-1 lines. The unit tests individual errors, bit error rates, errored seconds, severely errored seconds, unavailable seconds, degraded minutes and severely errored frames. The unit records total errors and percentage of errors for each measurement.

Technicians select menus and functions on the Chameleon 8000 by using five command keys on the console below the unit's CRT screen. Each command key, or CRT/softkey, corresponds to a function displayed on the screen.

The Chameleon 8000 enables technicians to monitor the signaling bit status of 24 DS0 channels on one screen. Technicians can custom program bit patterns or insert test tones ranging from 200 Hz to 3,600 Hz, including digital milliwatt and digital reference signals. An attached handset enables technicians to listen to the quality of a test signal.

The unit comes as a dual transmitter/receiver. As a transmitter, the unit generates test and voice signals and transmits them over the line for testing. As a receiver, the unit enables technicians to test two DS1 lines simultaneously. The unit also automatically adjusts to the line codes and framing formats of the circuits being tested.

The Chameleon 8000 can be expanded with option boards that attach to an internal Texas Instruments, Inc. NuBus interface. One optional board available through Tekelec supports a printer that provides a hard copy of test results.

Chameleon 20-P

The portable Chameleon 20-P enables technicians in the field to test and analyze communications protocols, including X.25, X.75 and Systems Network Architec-

(continued on page 24)

Racal-Milgo enhances T-1 mux, unveils mgmt. tools

By Jim Brown
New Products Editor

SUNRISE, Fla. — Racal-Milgo recently enhanced its Omnimux 8000 T-1 multiplexer to support multipoint links and released a pair of network management tools for the Omnimux and other Racal-Milgo products.

The Omnimux 8000 is aimed at small to midsize users. Racal-Milgo will continue to sell Digital Communications Associates, Inc.'s high-end System 9000 T-1 multiplexer under the Omnimux 9000 name.

The Omnimux 8000 has four shelves, each of which has 16 slots that can hold a mix of T-1 and voice and data interfaces.

Voice interfaces that support 64K bit/sec pulse code modulation (PCM) and 32K bit/sec adaptive differential PCM are available. Racal-Milgo also offered a voice interface that digitizes voice at 16K bit/sec using a proprietary algorithm. Available data interfaces have two to eight RS-232 or V.35 ports supporting asynchronous data at speeds up to 19.2K bit/sec and synchronous data at up to 1M bit/sec.

The Omnimux 8000 can support up to eight T-1s, and up to 255 Omnimux 8000s can be linked in a multipoint T-1 backbone network. Each unit now supports drop-and-insert functions, enabling a midstream Omnimux 8000 to extract 64K bit/sec DS0 channels from a T-1 line and replace them with traffic destined for other locations.

Another new feature enables the product to automatically reroute traffic around failed trunks. The new model also supports an internal digital access and cross-connect function that switches DS0 channels between T-1 links.

Users can monitor, control and configure local and remote Omnimux 8000s from an ASCII terminal.

Users have the option of managing Omnimux 8000 products from Racal-Milgo's Communications Management Series (CMS) 2000, a Digital Equipment Corp. VAX-based system.

CMS 2000 can be used to control a mix of Racal-Milgo products, including modems, data service units and statistical multiplexers.

Prices for an Omnimux 8000

(continued on page 24)

Data Switch unveils channel net device

HostNet Model 9089 connects up to 16 local and remote IBM mainframes at channel speeds.

By Paul Desmond
Staff Writer

SAN DIEGO — Data Switch Corp. recently unveiled a host networking system that enables up to 16 local or remote IBM- or plug-compatible mainframes to communicate at channel speeds.

At a press conference during the recent Tele-Communications Association, Inc. Annual Conference here, Data Switch Chairman Richard Greene said the HostNet Model 9089 is the "missing link" in the effort to enable users to access information residing on any CPU in a network.

The 9089 host networking system can also be used to connect multiple logical environments created in an MVS/ESA operating system using IBM's Processor Resource/System Manager (PR/SM). PR/SM subdivides one MVS/ESA environment into four logical environments, each of which is treated as a separate CPU by the 9089.

A single 9089 cabinet can support up to eight mainframes and be expanded in two-channel increments to support a maximum of 16 physical or logical CPUs. The device supports 3M or 4½M byte/sec channel speeds over T-1 or T-3 lines and over fiber-optic cable at up to about 4 miles.

The 9089 provides for channel-speed transmission over T-1 and T-3 lines by buffering the data as it comes out of the CPU. The product supports interlocking and data streaming by creating data acknowledgments on each end of the line that simulate those generated by a CPU.

No proprietary software or firmware is required with the 9089, and it works with any IBM System/360 or System/370 mainframe operating system.

It has six 4½M byte/sec internal buses that provide an aggregate throughput of 27M byte/sec, Greene said. The buses increase data throughput and provide redundant data paths.

Its distributed control processors ensure that a failure within one channel affects only that channel and allows all others to continue to operate. The 9089 also has dual power supplies, system arbiters and cooling systems to provide redundancy.

Error logs and on-line status are displayed on the 9089's IBM Personal System/2 Model 30-based system controller. That unit can also be linked to Data Switch's new TotalNet network management system.

Its addressing scheme allows one channel to be adressed to multiple other channels. This lets users choose a scheme that would provide for the routing of traffic around a lost link.

In addition, users can configure one channel to back up one or more other channels. For an application that does not provide one-to-one channel backup, a matrix switch would be required to switch traffic from a failed channel to the backup.

The 9089 is an enhancement of Data Switch's Model 9088, which allows local CPU connectivity at channel speeds.

Greene described a 9089 application Data Switch is installing for an automobile manufacturer. Although he declined to name the automaker, the application calls for linking a design center, assembly plant and parts manufacturing site, each with three or more physical or logical CPUs.

> Greene said the 9089 is the 'missing link' in enabling users to access any CPU in a network.
>
> ▲▲▲

Three CPUs will connect to a 9089 at the design center, which will link over four miles of fiber cable to another 9089 in the assembly plant, which supports three more CPUs. T-1 and T-3 lines will link the assembly plant with a 9089 at the parts manufacturing site located 10 miles away.

At the parts manufacturing site, the PR/SM software is used to divide an IBM 3090 mainframe into four logical CPUs. That site is linked by T-1 and T-3 lines to the design center, which is eight miles away. In this way, Greene said, a user at any one of the three sites could access information from any one of the six physical or four logical CPUs on the net.

Available now, the HostNet Model 9089 starts at about $150,000 for a four-channel configuration supporting one remote CPU. A configuration supporting eight channels, three of which are remote, costs $350,000.

Data Switch can be reached at One Enterprise Drive, Shelton, Conn. 06484, or by calling (203) 926-1801.

VMX/Opcom call system to sport adaptive integration

D.I.A.L. call processor works with five PBXs.

By Rex Bowman
West Coast Correspondent

VMX/Opcom, Inc. recently announced it will provide adaptive integration with its Direct Access Link (D.I.A.L.) call-processing system for five different AT&T and IBM/Rolm Systems Division private branch exchanges.

The company, which will change its name to VMX, Inc. early next year, also introduced an upgraded software release for the VMX 1000 and VMX 5000 call-processing systems.

Adaptive integration, according to VMX, enhances the usual benefits of integrating call-processing systems with PBXs by supporting new features.

For example, adaptive integration allows calls to be passed to designated coworkers or staff members instead of to a voice mailbox.

When the D.I.A.L. system passes a call to an alternate extension, it informs the recipient that the call is being passed to him from another line.

Adaptive integration also lets users determine who will receive their calls depending on the time of day and on whether the calls are external or internal.

In December, VMX will provide adaptive integration for AT&T's System 85, IBM/Rolm's CBX II 8000 and 9000, and IBM's 9751. Adaptive integration is already available for use with the AT&T System 75.

The adaptive integration product consists of hardware and software for D.I.A.L. and sells for $10,000.

VMX also introduced Release 9.6 software for the VMX 1000 and VMX 5000 call-processing systems. The offering is an enhancement of Release 9.2.

Features of the new release include an on-line overview of how the system works and a tutorial that uses voice prompts to help first-time users enter their names and passwords into the system.

With the new software release, callers who do not want to leave a message can access another person's extension by dialing 0 and the corresponding extension number.

The software also reduces addressing error on internal calls by requiring users to enter their names and passwords into the system.

For instance, a caller will no longer hear, "You have reached extension 366." Instead, a caller will hear, "You have reached extension 366, John Smith," according to VMX.

Release 9.6 also features transparent addressing, which allows voice-messaging service bureaus to assign hidden address prefixes to voice mailbox addresses. This allows the service bureau to assign the same mailbox addresses to different companies.

For example, Company A employees could be assigned hidden prefix 313, while Company B employees could be assigned hidden prefix 626.

Consequently, an employee of Company A with mailbox address 100 would not receive the messages of the Company B employee with the same mailbox address.

In addition, the software features more detailed transaction reporting than Release 9.2, such as billing information and data on message-retention time. The software also features a network routing selector feature which lets the PBX direct network calls to alternate long-distance carriers.

Pricing

The enhanced software, available to current VMX/Opcom customers now and to the public in early 1989, will not mean a higher price for the VMX 1000 and VMX 5000 systems, according to a company spokesman. The VMX 1000 currently carries a price tag ranging from $35,000 to $100,000. The VMX 5000 is priced from $120,000 to $500,000.

The price for upgrading installed systems depends on the customer's particular service agreement with VMX/Opcom. Customer service agreements vary from customer to customer.

VMX/Opcom can be reached at 110 Rose Orchard Way, San Jose, Calif. 95134, or call (408) 943-0878.

First Look

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an X.25 network via a single X.25 communications link.

The 3270 BSC PAD supports four BSC lines with a maximum of 16 cluster controllers and 64 devices per PAD. The four lines can be configured individually for host or terminal emulation.

Both are available now. The MB3-PSW ranges from $4,100 to $6,500, and the BSC PAD costs $4,100. All prices include both the Featurepak cartridges and MB3.

Micom Systems, Inc., 4100 Los Angeles Ave., Simi Valley, Calif. 93063, or call (805) 583-8600.

Modem for E-net over broadband coaxial out

Lanex Corp. recently announced a multiport modem that allows Ethernet devices to operate on broadband coaxial cable. Called the **TRN8023,** the modem provides voice, video and data transmission among Ethernet nodes that are more than 1,500 meters apart, the maximum distance possible under Ethernet.

The TRN8023 modem converts digital signals to radio frequency signals running on analog central antenna television broadband cable. The modem conforms to the IEEE 802.3 and 802.7 10Broad36 standards and has carrier-sense multiple access with collision detection error-checking capabilities.

Ethernet circuits attach to the modem via a standard 15-pin access unit interface. Broadband cable leaves the modem through a 75-ohm coaxial attachment.

The TRN8023 comes in two- and four-port models.

The two-port model is priced at $2,695, and the eight-port model costs $2,995. Both are available now.

Lanex Corp., 10727 Tucker St., Beltsville, Md. 20705, or call (301) 595-4700.

DA Systems to support iNet's E-mail service

DA Systems, Inc. recently announced it will support **iNet Co. of America's INET** electronic mail service through its **DASnet Inter-System Electronic Mail Service (Intermail).**

DA Systems will list INET among the roughly 25 E-mail services that it provides access to, including AT&T Mail, MCI Mail, Dialcom and The Source.

Intermail is available to INET users through a messaging application in the basic menu. Intermail users can choose from such options as messaging one address or multiple addresses at the same time, urgent delivery, return receipt and facsimile.

DA Systems, Inc., 1503 E. Campbell Ave., Campbell, Calif. 95008, or call (408) 559-7434. iNet Co. of America, 4795 Meadow Wood Lane, Chantilly, Va. 22021, or call (703) 631-6500.

Ventel unveils modems for micros running OS/2

Ven-Tel, Inc. recently introduced two error-correcting modems for IBM microcomputers running the OS/2 operating system.

The **24/2E Internal Modem** is used with IBM Personal System/2s and is compatible with the Micro Channel architecture. The **PC Modem 2400E** internal modem works with IBM Personal Computers, ATs and XTs.

Both modems transmit asynchronous data over full-duplex dial-up lines at speeds up to 2,400 bit/sec.

The modems conform to Bell 212A, 103, 113 and V.22 transmission standards.

Both modems use Microcom, Inc.'s Microcom Network Protocol (MNP) Level 5 and X.PC error-correction protocols.

X.PC works on public data networks such as Tymnet. MNP Level 5 provides data compression to 4.8K bit/sec over point-to-point dial-up lines. Users switch between protocols by striking a key, rather than programming commands on the Personal Computer.

The modems have autodial, autoanswer, automatic fallback and self-test capabilities.

Both modems are priced at $549 and are available now.

Ven-Tel, Inc., 2121 Zanker Road, San Jose, Calif. 95131, or call (408) 436-7400.

Racal-Milgo enhances mux

continued from page 23

range from $7,000 to $50,000, depending on configuration.

In the network management arena, Racal-Milgo introduced CMS Multi-Link 4, MS-DOS software that enables IBM Personal System/2 Model 50 or Model 80 microcomputers to control a mix of Racal-Milgo products.

Microcomputers with CMS Multi-Link 4 can act as control consoles for Racal-Milgo's CMS 2000, Racal-Milgo, Ltd.'s CMS 300/385 Series (a British version of the CMS 2000), Omnimux 8000 T-1 multiplexers and Omnimux Programmable Network Processor X.25 packet switches.

The software also enables the microcomputer to support Racal-Milgo's CMS Gateway I, enabling it to act as an IBM NetView net management console as well as the control console for three other Racal-Milgo products.

Racal-Milgo is currently planning an OS/2-based version of the package. The existing software carries a two-year license fee of $5,425.

Lastly, Racal-Milgo introduced a low-end version of its CMS network management system. CMS Nucleus 200 software runs on IBM Personal Computers or Personal System/2s.

The software can be used in conjunction with a microcomputer add-on board. It can also be used with a stand-alone device that links to the diagnostic port of central-site Racal-Milgo modems, multiplexers or DSUs that collect diagnostic information from remote devices.

The Internal Diagnostic Multiplexer (IDM) 8 board has eight RS-232 ports supporting links to the diagnostic ports of eight central-site devices.

The stand-alone unit, the External Diagnostic Multiplexer (EDM) 16, has 16 RS-232 ports that support links to the diagnostic port of 16 central-site devices. The EDM 16 also has a single microcomputer RS-232 link. CMS Nucleus 200 users can dial in to the EDM 16 unit to collect diagnostic information.

CMS Nucleus 200 will support up to 32 ports and a total of 512 devices. With the software package, users can monitor, test and configure networks of Racal-Milgo equipment.

A two-year CMS Nucleus 200 software license costs $3,071. It costs $1,000 to purchase the IDM 8 boards or the EDM 16 stand-alone units needed to support 32 ports.

Tekelec airs protocol analyzers

continued from page 23

ture protocols, including asynchronous and Binary Synchronous Communications.

The Chameleon 20-P is compatible with Tekelec protocol analyzers Chameleon 32 and Chameleon 20-I. A modem hookup enables a technician in the field to transfer files to these compatible systems. A technician in the company's data center can also operate the Chameleon 20-P remotely from the Chameleon 20-I or 32.

The Chameleon 20-P can be operated by a 3½-in. disk programmed in compatible Tekelec test systems.

The Chameleon 20-P has a 10M-byte hard disk with an electroluminescent flat-panel display and keyboard.

Chameleon 20-I

The Chameleon 20-I performs the same protocol tests as the Chameleon 20-P, but it can also test Integrated Services Digital Network B and D channels for both Basic Rate and Primary Rate Interfaces.

The unit is compatible with the Chameleon 32 and runs applications developed on these test systems. The Chameleon 20-I can be remotely controlled by the Chameleon 32, and the two systems can exchange files and use compatible disks.

Like the 20-I, the unit has a standard 10M-byte hard disk with an electroluminescent console and keyboard.

Test System option

The DS3 option on the TE820A DS1 Test System enables users to test 45M bit/sec T-3 fiber facilities by generating and receiving a variety of T-3 signals. Also, technicians can isolate and test DS0 channels that have been dropped from a T-3 circuit. Technicians can perform bit-error rate tests, as well as voice-frequency tests using a loudspeaker that is built into the TE820A.

All products will be available in the fourth quarter of this year. Pricing for a single-receiver Chameleon 8000 starts at $7,250. The Chameleon 20-P is priced at $14,500, the Chameleon 20-I costs $16,995, and the DS3 Option for the TE820A DS1 Test System is priced at $6,000.

Tekelec can be reached at 26540 Agoura Road, Calabasas, Calif. 91302, or call (818) 880-5656.

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Howard Anderson is managing director of the Yankee Group, a Boston-based information-industry market research and consulting firm.

Jim Mathieu
One of the ISDN users, Mathieu is supervisor for telecommunications planning with Lockheed Missiles and Space in Sunnyvale, California.

Richard K. Snelling
Richard Snelling is Executive Vice President with Southern Bell Telephone and Telegraph.

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John Kauza is Product Manager, ISDN Services, with AT&T.

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Scott Augerson is Group Product Manager, Systems and Networks, with Siemens Information Systems.

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OPINIONS

MARKETING STRATEGIES

BY JAMES CARLINI

Vendors fail to address needs of midsize market

Leading vendors in the communications industry are focusing an excessive proportion of their marketing research efforts on their large accounts. We all recognize how the strategic application of telecommunications has helped some of America's largest companies move to the leading edge of their industries, but what about the midsize market?

Unfortunately, many vendors are missing the boat. Most large organizations have already selected a strategic direction to pursue and are unlikely to dismantle a multimillion-dollar installation of Brand A equipment to go with Brand X. These firms have selected their primary vendors and network architecture and are now looking at lower cost replacement equipment that fits in with their current environment.

> Vendors don't use the right yardsticks to measure the potential of smaller accounts.
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Vendors don't use the right yardsticks to measure the potential of smaller accounts. Too often, they take a standard measure, such as the number of phones the account has, and immediately classify the account by that measure — without even asking what applications the user may be contemplating.

A recent example of this in the private branch exchange market was a limousine service that had 40 phones and was looking for a new PBX switch. Some vendors automatically wrote it off as a one-for-one replacement with a contract of less than $28,000. They didn't look at the potential applications the owner was considering, such as revenue tracking, agent performance tracking and fleet management. If they had, they would have submitted bids based on a $115,000 integrated system, with automatic call distribution, voice mail and an automated attendant.

Blame the marketing people for not identifying the potential. Vendors should not expect users to realize all of the options available to them, and they can help users and themselves by pointing them out.

Small and midsize organizations can apply telecommunications successfully to dramatically affect their positions within their own markets. Real growth and opportunity lie here, in the midsize businesses, where implementing a new communications-based application will create more business and will also stir other companies to do the same.

Midsize users are looking for a high creativity level in vendors to design complex solutions for their businesses and industries. They do not want to be presented with the same applications used by large organizations because these cannot really be altered to fit their specific needs.

The need for consultants who are knowledgeable in the area of midsize applications is also critical. Many consultants use the same yardsticks vendors use; therefore, they also fail to see the potential applications. They must become more creative and look for possibilities beyond what is already in place. Since some small and midsize organizations don't have an expert telecommunications staff, consultants must be able to visualize integrated applications and guide users as well as vendors.

In this industry, the future belongs to the swift and the decisive. If vendors, consultants and users can collectively create new examples of applying integrated telecommunications to help small and midsize businesses, they will have a market that is virtually untapped. ■

Carlini is president of Carlini & Associates, Inc., a management consulting firm in Hinsdale, Ill. He also lectures on information technology at Northwestern University in Evanston, Ill.

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EDITORIAL

The FCC: asleep at the wheel on AT&T's Tariffs 12 and 15

Once again, the Federal Communications Commission has failed to provide necessary leadership to the communications industry.

In the case of AT&T's Tariff 15, the FCC's decision to allow the long-haul giant to move ahead while the agency investigates the proposal is really no decision at all. But that's typical of the FCC's approach to certain key issues, such as whether AT&T should be given wider latitude in competing against increasingly nimble rivals.

Take the matter of Tariff 12. Under Tariff 12, AT&T can design a custom network that blends a variety of services at off-tariff prices. Tariff 12 has been harshly criticized by a number of organizations that have raised legitimate concerns.

But what has the agency done?

The FCC has allowed AT&T to go forward with three of the five Tariff 12 networks it has proposed while it investigates the tariff's legality. The agency has yet to decide how to handle a recently filed Tariff 12 plan for American Express Co.

By taking this approach to Tariffs 12 and 15, the FCC has put opponents of the plans in limbo. And it has effectively freed AT&T from the regulatory constraints intended to bind it. AT&T, at least as far as it has pushed, has been able to sidestep its own tariffs to keep big users in the fold.

This is not intended as criticism of AT&T or of Tariffs 12 and 15. AT&T has understandable reasons for seeking additional market flexibility, and there are many individuals, including users, who believe the time has come to loosen the regulatory constraints. Tariff 12 and Tariff 15 may be the appropriate mechanisms for giving AT&T new freedom. That's for the FCC to decide.

Unfortunately, the agency doesn't seem to be willing to make the decisions.

> One has to ask whether the FCC is ever so silently promoting deregulation by deciding not to decide on major issues.
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For weeks, the FCC put off a decision on Tariff 15, pushing the tariff's effective date further and further back only to finally allow AT&T to proceed as planned under a cloud of doubt.

The FCC's nondecision puts the first AT&T customer to win a Tariff 15 competitive pricing plan in an interesting situation. Should Holiday Corp. go ahead with the network scheme developed by AT&T in the hopes that the FCC will ultimately approve Tariff 15? Or should it hold off in case the agency rules, or is forced to rule, that the tariff is unlawful? It would be ironic if this confusion convinced Holiday to accept the MCI Communications Corp. offer that prompted AT&T to file the competitive pricing plan.

The FCC's inaction on Tariff 15 is particularly troubling given there were clear indications that forces within the agency were opposed to the plan.

An internal memorandum obtained by *Network World* ("FCC unit to advise Tariff 15 rejection," *NW,* Aug. 15) indicated that the FCC Common Carrier Bureau recommended rejection of Tariff 15.

When the FCC announced its nonruling on Tariff 15, Commissioner Patricia Diaz Dennis issued a dissenting statement supporting suspension of the tariff during an investigation.

One has to ask whether the FCC is ever so silently promoting deregulation — a favorite cause of the Reagan administration — by deciding not to decide on major issues such as Tariffs 12 and 15.

If that's the case, the agency is misguided. The FCC's job is to set the pace, to make the rules for the communications industry.

If it feels that deregulation is the correct strategy, it should enact policies and make decisions that promote deregulation. If the agency feels things should remain the same, its decisions should reflect that view.

To do otherwise is to fail its constituents: the vendors and users that need a clear understanding of what lies ahead. ■

REGULATORY SAFEGUARDS

BY ROBERT STEARNS

It's time for even-handed rules

This could be the year the telephone industry's luck runs out at the Federal Communications Commission. Over the past several years, AT&T and the Bell operating companies have successfully exploited the current administration's general antipathy toward government and persuaded the FCC to initiate many proceedings to remove or eliminate regulatory safeguards.

But these developments have evoked a growing chorus of criticism from equipment manufacturers, enhanced service providers, interexchange carriers, large communications users, public interest organizations, state regulatory officials, legislators and reviewing courts. The pendulum may be about to swing back toward more active regulation.

To some extent, any such change may reflect predictable, periodic changes in policy trends. It may also reflect the fallout from the adverse consequences attributed to deregulation in other industries, such as airlines and savings and loans institutions. And it may result from the fact that deregulatory sentiments have led the FCC to make decisions that were demonstrably wrong — decisions that are indefensible even in terms of their stated objectives.

Two examples of these phenomena involve "nonstructural safeguards" adopted in the Third Computer Inquiry and related proceedings dealing with AT&T's and the BOCs' provision of customer premises equipment.

In those proceedings, the FCC candidly admitted that AT&T and the BOCs are dominant in the transmission services marketplace and, unless checked, can leverage that dominance to gain unfair advantages for their enhanced services and customer premises equipment.

But the FCC was determined to eliminate the requirement that carriers market their unregulated services and products via separate subsidiaries, even though the agency knew the dangers of anticompetitive abuse could be increased only by the commingling of regulated transmission services activities with unregulated enhanced service and customer premises equipment activities.

The commission promised to establish detailed rules to foreclose each of the various avenues by which the carriers could improperly advantage their unregulated operations.

In formulating these rules, however, the FCC failed to take the steps necessary to prevent unfair competition and protect consumers. In each case, these goals were balanced against some interest of the carriers. The resulting decisions were invariably less than adequate.

Disclosure of information

Equipment manufacturers need to know the characteristics of new or changed network services in order to design compatible customer premises equipment. Until recently, the rule was that AT&T had to make such information available to independent manufacturers at the same time that it was made available to AT&T personnel involved in the design and development of customer premises equipment. Thus affiliates and nonaffiliates could begin the customer premises equipment design (or redesign) process at the same time.

> In formulating these rules, the FCC failed to take the steps necessary to prevent unfair competition and protect consumers.
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The commission changed that rule. AT&T can now provide advance notice of a network change to its own customer premises equipment design personnel, but it need not disclose such information to nonaffiliates until it has completed the design process and reached a decision about whether to make the customer premises equipment itself or buy it from a third party.

Under this approach, AT&T's customer premises equipment designers may have 24 months or more to accommodate a network change, while independent customer premises equipment manufacturers may have only 12 months to accommodate the same change. In some circumstances, the network information may become available to third parties as little as six months before the network change goes into effect. As U.S. District Court Judge Harold Greene noted last summer, the information will now reach independent manufacturers too late to ensure a fair opportunity to compete.

Use of information

The FCC also established discriminatory rules governing the use of the customer proprietary network information (CPNI) that carriers obtain in the course of providing transmission services. In essence, the rules provide that AT&T and the BOCs are permitted to use CPNI in their efforts to market enhanced services and customer premises equipment, except where a customer specifically instructs them not to. But independent enhanced service providers and customer premises equipment vendors may not access the CPNI unless they have express customer authorization.

Therefore, the carriers' competitive enterprises can make use of this information while their competitors cannot. Inertia, being the force that it is, allows this to continue. Such a discriminatory practice will undermine the full and fair competition that the commission claims to promote.

One could as easily fault the FCC for establishing patently inadequate means of overseeing potential discrimination in the provision of regulated transmission services or for relying on completely new and untested accounting procedures to ensure that the billions of ratepayer dollars that flow annually to AT&T and the BOCs are properly allocated.

It hardly matters which examples are chosen. The FCC has deliberately decided not to prescribe, much less enforce, those safeguards that are necessary to prevent dominant carriers from competing unfairly in the enhanced services and customer premises equipment markets.

The result will be diminished competition, with a corresponding diminution of the benefits that competition produces for the public. Sooner or later, the pendulum will swing back. ◼

Stearns is vice-president of corporate development at Codex Corp. in Canton, Mass.

TELETOONS

BY FRANK AND TROISE

Now look at me! You are not "Network woman"! Your name is Alice and you need some time off!
Phil Frank

LETTERS

RFP responses

We'd like to respond to George Moskoff's recent column ("Voice system suppliers need new sales strategy," *NW*, July 11) and letter (Sept. 12).

We are a telecommunications consulting group that prides itself on the ability to meet clients' requirements by creating innovative and workable solutions to their telecommunications problems. The services we provide are for technological applications for such varied systems as private branch exchanges; key systems; VHF, UHF and 800-MHz radio; and data systems involving minicomputer and mainframe software and associated peripherals. As such, we are extremely disappointed in Moskoff's reversal of his position regarding responses to requests for proposal.

We have been besieged by vendors whose systems fail to meet the baseline requirements as set forth in our RFPs and who continue to promote and lobby for their systems through any, sometimes including unethical, means. They are promoting systems as dictated by their marketing departments — systems designed to use excess equipment in central offices or obsolete equipment sitting in warehouses. In many cases, the offerings they propose have not changed significantly

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Network World *welcomes letters from readers. Letters should be typed, double-spaced and sent to Editor,* Network World*, 375 Cochituate Road, Box 9171, Framingham, Mass. 01701.*

Letters may be edited for space and clarity.

IN VINO VERITAS, or so they say. But if you don't need to become inebriated in order to tell us what's truly on your mind, then *Network World* would like you to write a guest column for our Opinions pages.

Columns should be timely, opinionated, literate, thoughtful and accurate.

Manuscripts should be letter-quality, double-spaced and between 600 and 900 words in length. Disk or modem submissions are preferred.

If you'd like to write a column, contact Steve Moore, features editor, *Network World,* Box 9171, Framingham, Mass. 01701, or call (508) 820-2543, ext. 732.

The life busine
drop-dead tech

Mountains of paperwork were killing the productivity of a life insurance colossus.

Compounding the paper problem, great hanks of wires hung from the ceilings and squirmed under the floors, further evidence of their antiquated information system.

NYNEX technology to the rescue.

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1200 work stations were fully integrated. Each company employee could talk on the phone and access an existing computer data base at the same time. Over the same wires!

As workers moved from station to station, company productivity moved with them. They could plug into the information system from any phone jack.

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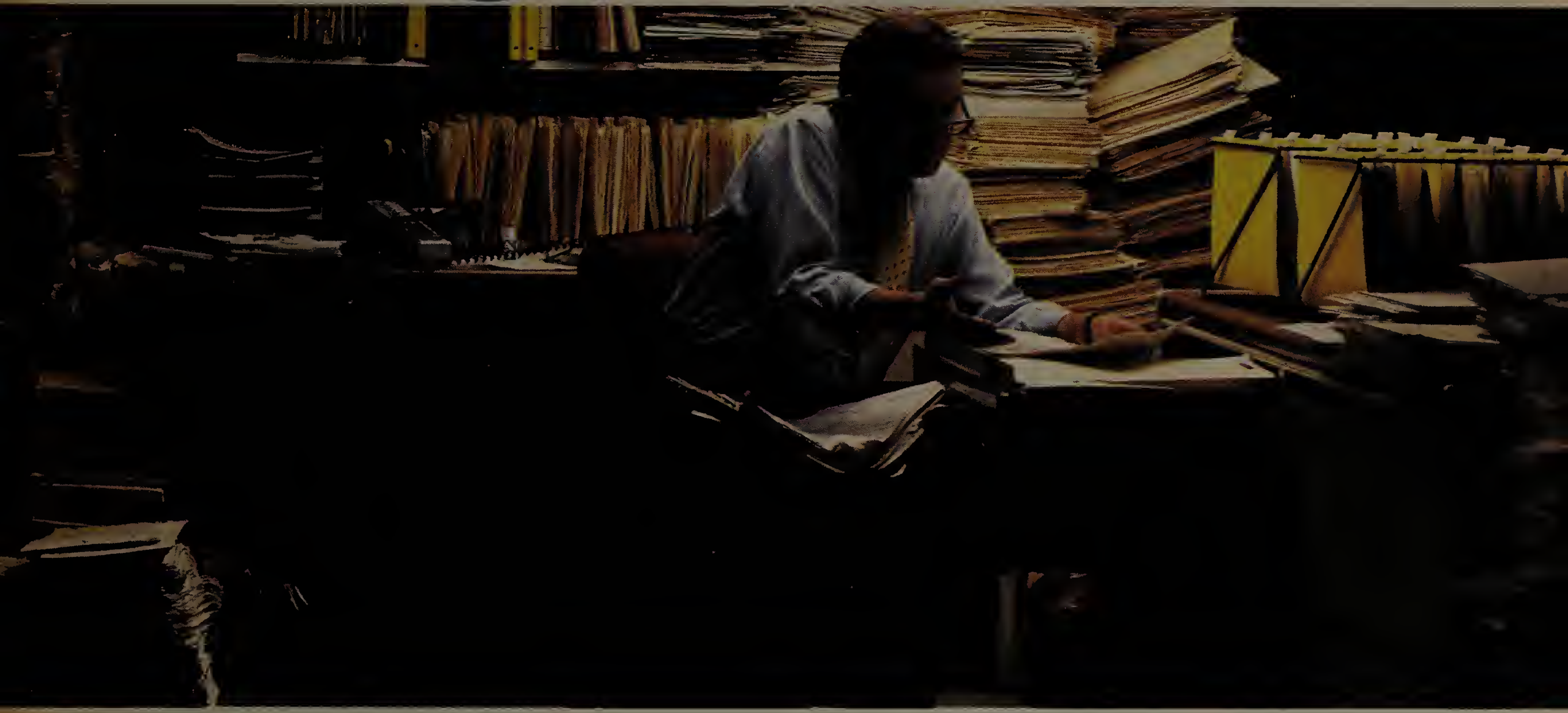

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NYNEX

JUDY FILIPPO

Homegrown net management

A user's perspective on sorting out the hodgepodge of available network management systems

CONTINUED FROM PAGE 1

NetView and DEC's Network Management Control Center. However, since these systems are managing only specific network elements, the term network element management systems (NEMS) will be used when describing them.

Limitations

The limitations of these systems remain the same as in the original module offerings. Vendor-developed NEMSs are designed primarily around the vendor's architecture with occasional hooks into other net management systems or other vendors' equipment. They concentrate mainly on managing elements such as modems, terminal controllers and front-end processors.

These NEMSs control and manage only specific areas and elements within the variety of networks that compose the corporate network.

Consequently, vendors often overlook the need of the user to manage all the different networks that form the whole without worrying about the protocols or architectures that it comprises. The user is left with incompatible NEMSs that need, in most cases, separate staff, with different training and levels of expertise, and reside within vendor-specific subnetworks accessed through different network operator consoles.

Pressure for connectivity

The pressure from large corporate users for complete network management forced the vendor community to form alliances and provide interfaces to other systems, in a way similar to the approach IBM takes with NetView/PC. However, these interfaces are mainly patches, and their functionality is limited to alarm collections and other reporting functions.

The general consensus is that no single, commercially available net management system can perform the task of managing a multivendor, mixed-architecture network. It is therefore essential to view network management in a different light. Any planning or discussions that take place must consider the following:

- The user must acquire a number of NEMSs in order to provide efficient management for all the network elements. As a result, the staffing levels and training requirements for the personnel in charge of managing the network increase dramatically.
- The user must assume overall responsibility for successful integration and must follow a careful NEMS module-selection process.
- Before the integration process begins, the user should take under consideration the imminent arrival of international standards for network management.
- As a last resort, the user must also consider implementing a single-vendor corporate network. This, however, is not practical since it limits the options available to the user.

A review of offerings from various companies shows that two design architectures appear to be most commonly used by vendors.

The first approach is based on the notion that a net management system should focus on path and network-availability control. This approach is taken by modem and other communications equipment vendors.

A system designed in this way allows the network operators to identify disrupted paths or congestion points in the network without needing to know which applications or users are affected.

The system provides alarms and status reports about the network components, such as lines, modems, multiplexers and other equipment in real time. The status of the entire physical network

(continued on page 34)

Papageorgiou is the manager of technology and standards for the telecommunications department of United Parcel Service, Inc. in Paramus, N.J.

ILLUSTRATION ©1988 JUDY FILIPPO

Have the limits of
become un

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(continued from page 31)

is available to the network operators at a glance using graphical representations.

This type of net management system becomes an extension of the physical network, and it ignores the network's reason for existence — serving the end user, whether an application or a person. This method is valuable for identifying and correcting physical network problems, sometimes before the user even notices them. However, it does not help in cases where the problem is application specific, that is, in the software. Eventually, this net management system's inability to associate network paths with applications becomes a liability.

Most end users don't know or care what piece of the network they are connected to; they are only concerned about the applications they are using. From a user's perspective, if for some reason an application is not accessible, the network is considered unavailable, and the details do not matter.

A potential problem with this type of net management system is the proliferation of packet-based protocols and peer-to-peer connectionless communications. Point-to-point circuits are replaced by virtual paths, the network is used as an intelligent router, and sessions can be active even if paths and nodes fail. When that occurs, a node or link fails, and the net management system will identify it and produce an alarm, just as it is supposed to. Because it is concerned only with physical paths, it will not be able to provide the application with reconfiguration or fault management.

Net management systems of this type are hardware and modem control systems and other equipment-monitoring facilities, such as the Dataphone II Network Management System from AT&T.

Session-oriented approach

The second approach is to design a net management system that focuses on session control. This approach allows the network operators to identify and monitor calls to an application through the network without needing to know what route the call took in order to reach the application. A typical example is the functionality built into IBM's NCCF. By having access to the VTAM facility and NCP, NCCF permits a network operator or program to monitor and control sessions. When a session is lost, the network operator can re-establish it or, more specifically, reactivate it.

> With session control, the management system can direct the network operator to search for the problem in the transport or physical areas of the network.
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However, if the problem is a bad line that requires dial backup, the operator has to use a path-control net management system, such as the AT&T Dataphone II, or manually initiate the dial backup procedure. When the link is reestablished, the operator can reactivate the session. However, NCCF will not be aware that the session has been rerouted to a dial backup facility because the path-control net management system is concerned only with the hardware and doesn't communicate with applications. In this case, the tool becomes an extension of the logical network, and it, from a management point of view, ignores the physical network.

> IBM's NetView mainly integrates the management of a Systems Network Architecture network with IBM equipment residing on it.
>
> ▲▲▲

The session control approach provides a very good answer to the familiar cry, "My system is down." If the application is up and running, the net management system can direct the network operator to search for the problem somewhere in the transport or physical areas of the network. Since this type of net management system does not help identify where the call gets blocked or fails, individual physical network troubleshooting mechanisms have to be invoked.

Physical/logical integration

Since both the aforementioned design approaches to network management stop short of a complete net management system in some way or another, a network management system designer must consider a mixed solution to the network management problem. By combining the physical management capabilities of the first approach with the logical capabilities of the second, a system designer can implement an efficient management system that controls the entire corporate network.

Some vendors are addressing the physical/logical net management system integration problem. Some even provide "complete" network management systems, both from the logical and physical points of view. IBM's NetView is a good example. It includes a hardware monitor, a session monitor and a status monitor, as well as control and help facilities, and it can also manage equipment and applications.

However, NetView still doesn't fit the definition of the ideal net management system. The reason? It mainly integrates the management of a Systems Network Architecture network with IBM equipment residing on it. When other vendors' equipment exists on the network, NetView becomes an alarm collector and reporter, and even then only through NetView/PC and only with those vendors that conform to IBM's specifications.

Implementation and design

The corporate network's ability to connect various end users (user to user, application to application or user to application) and to carry information between them consistently is critical to a corporation. Therefore, successful management of the corporate network is as important as any other corporate function. In order to maintain the network's service levels, the user must manage it as efficiently as possible.

Network management can be implemented using the tools and facilities available today and still be functional until standards arrive. To implement a management system, the user must first manage the physical part (end-to-end physical connectivity) and then focus on the logical part (end-to-end logical connectivity). If these two tasks are completed successfully, the user will be able to efficiently manage the current corporate network, and implementing the forthcoming standards will not require redesigning it.

The first step in designing a complete net management system is to implement a physical network management system. This involves, among other tasks, an inventory of all network components down to the end-node level. An end node is any device on the network that has more than one input or output; for example, an IBM or DEC host, terminal server, packet assembler/disassembler, 327X terminal controller, front-end processor or T-1 multiplexer.

During this phase, users should construct a complete, detailed map of the network, showing all physical connections between end nodes, indicating the kind of traffic and protocols used and the available and utilized bandwidth for each link.

When these steps are completed, the user can select and implement a physical network management system. This system will follow the first design approach discussed above, which focuses on network availability control. It will be the basis for the next step toward complete network management.

Examples of a physical network management system are the recently introduced Meridian Data Network System from Northern Telecom, Inc., AT&T's Unified Network Management Architecture (UNMA) and Codex's 9800 series of its Integrated Network Management System.

> Network management can be implemented using the tools and facilities available today and still be functional until standards arrive.
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The second step in the design and implementation of the complete net management system is the construction of a logical system. Once the physical network management system is in place, logical system construction will become a matter of identifying the applications that reside on each host, the access methods they support and the paths they utilize.

> The effectiveness of the system will depend on how well the net operators are trained.
>
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To construct a logical net management system, the user must inventory all the applications accessed through the network, including descriptions of the connection methods and protocols supported, such as dial-up connections, dedicated access, asynchronous, Synchronous Data Link Control or X.25.

The user must also perform a user population study to determine user locations, types and methods of connections, and the usage of the network in general.

When these steps are completed and the data collected is added to the network map, a logical network management system can be selected and implemented. This system must complement and be compatible with the physical net management system. Examples of currently available logical management systems are NetView and Cincom Systems, Inc.'s NetMaster.

At this point, assuming that the system designer followed the guidelines specified previously, the integration of the physical management system and logical management system can be accomplished.

For example, if the systems selected are compatible, reports on path availability or path failures from the physical system can be directed to the logical system, which can then adjust pacing so the active sessions do not overload the remaining physical paths.

If the logical system detects slow response time or a high number of retransmissions during a session, it can inform the physical system, which in turn can reroute the session over a new path. Since the logical system is aware of the status of applications, it can, for example, notify the physical system when sessions should be restricted to a specific physical path (such as an encrypted link), thus preventing any security breaches.

From this point forward, the effectiveness of the management system will depend mainly on how well the network operators are trained and the accuracy of the data maintained for all applications and users. This will make any transitions or conversions to a future Open Systems Interconnection-based system almost painless.

Even if the user chooses not to convert, the benefits from efficient corporate network management will be numerous.

Future directions

A true net management system provides a common interface between all the various architecture- and vendor-specific NEMSs. Its functionality and structure should be flexible enough to allow it to be interfaced with any

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The financial trading game in 1988

By VICTORIA BLACKFORD

Time is money in any market. But that adage is more literal in today's high-pressure, fast-paced financial trading arenas than anywhere else. The need for instant global communications and information availability is pushing traders and their equipment to the leading edge of today's technology.

Financial trading in a banking environment has communications requirements that are quite different from those of retail banking. The term "financial trading" refers to the buying and selling of financial instruments, such as foreign exchange, interest rate-based instruments, fixed-income issues and municipal securities.

The two principal groups of people present on a trading floor are traders and salespeople. The traders buy and sell a particular financial instrument and "take positions" for the bank's account, that is, either buy or sell to make money for the institution.

Salespeople serve customers of the bank and offer prices based on the traders' quotes. The customer can either refuse the price or accept it and enter into a contract with the bank.

Communications in this market has undergone tremendous changes in the past decade. In the late 1970s, the largest trading floor had 300 positions, compared with more than 1,000 today. Trading floors at that time used multiline telephone instruments called turrets. Turrets were available in multiples of 60 lines and provided for the termination of private, or dedicated, and dial-tone lines. Before divestiture, the only turrets available were AT&T's Comcore products.

Traders and salespeople accessed financial information services such as Telerate and Reuters individually via CRTs on their desks. Because each service was displayed on a separate screen, CRTs sometimes accumulated so rapidly that they hid the person using them.

1978-1988

During this decade, the importance of communications continued to rise, and communications staffers were dedicated to supporting the trading floors. These trading-floor support groups typically reported to separate business units under the corporate umbrella.

Competition in the turret market began when Interconnect Planning Co. offered an alternative to Comcore. Interconnect Planning became the dominant turret manufacturer in the New York market and remained so until further competition emerged in the mid-1980s.

The proliferation of CRTs on traders' desks resulted in the beginning of video switching.

Rich, Inc. pioneered this market in financial trading. Instead of having one monitor dedicated to each financial information service to which users subscribed, they could choose the service they wished to display from a menu. They could bring the menu up on any monitor they desired, using one common keyboard per

(continued on page 38)

Blackford is vice-president of data communications at The Chase Manhattan Bank N.A. in New York.

An in-depth look at one of today's most competitive and complex communications markets

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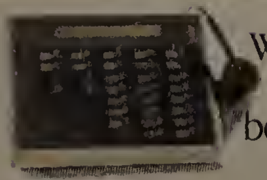

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(continued from page 35)

desk. Noncritical information, such as Dow Jones News, could then be accessed as needed, rather than displayed constantly.

This video switching capability was especially critical in the fixed-income market (corporate bonds and government securities), in which five major brokers supplied dedicated monitors to display market rates at the primary dealers' desks. Video switching created tremendous space savings at the desktop.

The equipment room was usually near, or right next to, the trading floor it supported. Cabling was straightforward; there was plenty of room to lay cables between the equipment room and the trading floor. Distance limitations were rarely a problem in transmitting signals.

Hoot-and-holler nets arose to accommodate the requirement for a "party line" internal to a company, so that all parties linked to the net only had to pick up their phones, without dialing, to listen to or speak to one another. For each user, the net functioned like a big, on-demand conference call. These networks were based on four-wire, multidrop circuits. They were — and still are — used for several functions:

■ Broadcast of urgent information simultaneously to all necessary locations.

■ Ongoing exchange of information among company locations.

■ Broadcast of strategy meetings.

In addition to video feeds and hoot-and-holler networks, communications departments installed audio signaling equipment for selected locations on the trading floor. These locations could then access audio information feeds pertaining only to their specific markets.

1988 digital trends

Historically, bank telecommunications organizations have included voice, video switching, market data, telex and general business equipment. Due to the special nature of the equipment, technical skills have always been gained through on-the-job training. Recent advances in technology have kept managers and staff alike deeply involved in this "learn by doing" mode:

■ **Turrets.** Turret design for the trading floor is changing from analog to digital to enhance transmission quality and prepare for Integrated Services Digital Networks. Digital turrets are also capable of accommodating more feed lines than in the past. Turrets used to handle a maximum of 240 lines but can now accommodate several hundred.

Twenty-five-pair cables are being replaced by "skinny wires," which are typically under five pairs each and require less space. Previously, dial-tone and private lines appeared as individual terminations on the turret.

Now the ability exists to segregate line pickups into separate "pages" that can be accessed and changed by a keystroke. These pages can be accessed on the screen as needed, like different menus on a CRT. Also, the physical size, or footprint, of most turrets has been greatly reduced.

■ **Video switching.** In the past decade, video switching has changed tremendously to serve traders better. Several financial information suppliers and government brokers now provide information in a digital, rather than an analog, video format. Consequently, traders can perform many new functions, such as manipulating data from one or more sources in a model to perform analysis.

Hoot-and-holler networks arose to accommodate the requirement for a "party line" internal to a company.

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Digital video technology also provides the ability to rearrange data from one or more sources and display it all on a customized screen. These "composite pages" have greatly improved data presentation. In addition, in-house data processing systems can now interface to a digital distribution system and be incorporated into any analytical or modeling activity.

Video switching technology has evolved differently on the two sides of the Atlantic Ocean. Digital feeds were available much earlier in the UK than in the U.S. European information providers, led by Reuters Ltd. in London, were among the first to recognize the advantages of digital transmission. Once the information providers offered digital services, European equipment vendors were motivated to adopt digital technology much sooner.

A purely digital environment will probably not exist in the U.S. in the near future. Information vendors have historically based their systems on analog technology, and the costs of changing to all-digital technology are high. Depending on the number of users, the charge for a digital feed may be higher than that for the same information provided in an analog video format. Typically, digital-feed charges include a fixed monthly fee and a per-terminal charge.

Users may decide that the break-even point for digital technology is too high, especially if they do not anticipate making full use of digital feed capabilities such as analytics, modeling and composite paging.

Digital feeds also raise issues concerning information dissemination and billing. Many users have the technical capability to distribute the information provided by a feed across country boundaries, which may be against the terms of the vendor contract — or even against local laws.

While vendors reserve the right to inspect a user's site, it is difficult for them to determine whether a user is improperly distributing information from a digital feed. Video feeds are easier for vendors to police; they terminate in a controller that supports from one to five terminals.

■ **Fiber optics.** No longer a particularly new technology, fiber optics are now being used in several ways in trading rooms. Traditionally, copper and coaxial cable has been run to the trading floor to support the information distribution system. But this requires that cable be moved or repulled as people on the trading floor change positions — a labor-intensive task.

Fiber optics can significantly reduce this "churning" of cables. The technology and economics for the encoders/decoders on the fiber ends has progressed to such a point that multiplexing data over one fiber, rather than allocating one fiber per screen, is reasonable. When installing fiber between the equipment room and the desk, users should consider pulling multiple fibers to incorporate future requirements.

Fiber can also be used in vertical cable runs between the equipment room and trading floor (if the two are located on different floors), where space may preclude traditional coaxial cabling. Horizontal runs use either traditional cables or fiber, depending on the cost. If fiber is used for the vertical and traditional cabling for the horizontal, then there must be a patch panel on the floor to facilitate the movement of cable as people shift.

In planning for the future — especially for expanded use of graphics — users must review the emerging Fiber Distributed Data Interface (FDDI) standard for 100M bit/sec fiber rings.

On the vertical runs, users should install 62½-micron, multimode, double-ring fiber — the FDDI de facto standard. For the horizontal runs, users can consider twisted pair or fiber optics. As the price of the terminating equipment decreases, fiber will become an even more advantageous solution.

■ **Local-area nets.** As the amount of text and graphics required at each trader's desk increases, the decision as to the type of local-area network used to support the trading floor becomes increasingly important.

The type and volume of transactions and the number of current and future users are factors in deciding on the type of local-area network. Transmission speed and throughput are not necessarily the same. For example, Ethernet has a 10M bit/sec transmission rate, but the throughput is only 2M to 3M bit/sec. For token-ring networks, by contrast, transmission speed and throughput are the same.

Local-area networks perform differently with various types of traffic. Ethernet is suited for bursty, random traffic conditions, while the token ring is favored when continuous traffic conditions prevail. As local net utilization increases beyond 20% for extended periods, Ethernet's carrier-sense multiple access with collision detection method can lead to performance degradation.

Users building new trading floors should seriously consider running a local-area network on the floor, rather than only in the equipment room. Cable savings can be great since only the local-area network cables would then be extended to the equipment room, rather than all the cables required at trading desks. The local-area network cables should be enclosed in conduit as a precaution against accidental cable cuts.

When a local-area network is added to an existing trading floor, it can be installed in one of three principal ways: in the equipment room; on the floor on a separate medium from the information distribution system; or in the equipment room with extensions to the floor via available spare coaxial or fiber cable.

With the last option, if spare fibers exist, users can extend the local-area network from the equipment room to the floor via these fibers with additional coder/decoders on the ends. The decision is individual and depends on each situation. The technically preferred solution may be financially impractical.

No longer a particularly new technology, fiber optics are now being used in several ways in trading rooms.

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Under any scenario, a potential outage is a critical issue, especially since critical data will be running on the local-area network. Users should provide a fully redundant system so that if a break occurs in the cable, they can shift over to the backup.

International issues

In the international arena, two activities differentiate the financial trading industry from others: use of interactive telex and the use of transoceanic cables, rather than satellite links, for dedicated lines.

In foreign exchange, trading is typically — although not exclusively — conducted via interactive telex. Because telex is a low-speed (50 baud) method of sending international messages, equipment vendors have attempted to improve throughput by using intelligent devices that support transmission speeds up to 9.6K bit/sec to their local switches.

As more transoceanic cables are laid, dedicated line prices continue to decrease. Historically, traders in New York and London have been connected by undersea private lines, mainly because of the lengthy delays — up to a half-second round trip — in sending and receiving information via satellite. Traders speak too quickly to tolerate this delay.

In the past, trading rooms were connected via voice and telex lines. Within the past two years, however, a consortium of London banks helped establish a service called FX Net, which links major banks in the London foreign exchange market via a data network. The project started in London because of the size of its foreign exchange market, but a similar installation is now under way in New York.

The main function of FX Net is "FX Netting," which provides for the netting of currency positions at the end of the day. This is the determination of the net value of the day's buys and sells by currency. The banks' exposure to risk through inaccurate information is reduced, and the need to confirm deals by voice is eliminated.

FX Net uses Digital Equipment Corp. MicroVAXes at each participant's location, linked by an X.25 network. MicroVAXes are recommended because of their communications and closed user group capabilities, which allow communications only among a predetermined group of people. X.25 was chosen for its universality as well as its compliance with other international standards. The future New York-to-London connection will be X.75.

New technology issues

To optimize their operations, communications managers in financial trading environments must examine many aspects of these new technologies:

■ **Direct dealer entry.** In the past, lead times of 15 to 20 minutes have existed between the writing of a deal ticket with all pertinent information related to the buy or sell and the entering of that ticket into the back-office computer system. This situation is especially troubling in markets that move quickly, such as foreign exchange.

Traders have always maintained manual "blotters" showing all the buys and sells that have occurred to keep track of their currency positions, rather than relying on outdated information generated by the computer system.

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GUIDE

Data switches

A switch in direction

As their original markets decline, new uses offer new life for some vendors of data PBXs.

By JOHN HUNTER

As companies turn to local networks, switching statistical multiplexers and networked T-1 multiplexers to connect users with resources, many industry experts feel that the data PBX is living on borrowed time. For some products, it's probably true that traditional markets are eroding. But a few savvy vendors have found new uses that promise to open new markets.

The data private branch exchange was an industry highflier from the mid-1970s to the mid-1980s, but then storm clouds began appearing. According to Glenn Falkowski, president of Glencom Systems, Inc., a Linden, N.J.-based value-added reseller, companies discovered that the personal computer could handle many functions slated for minicomputers for a lot less money. Predictably, they started buying more personal computers and fewer minicomputers. Since one of the popular uses for data PBXs is to furnish port-sharing for minicomputers, market demand began to soften.

For the data PBX to flourish, new applications and markets must be found. Some users are interconnecting data PBXs to furnish wide-area networking of computer resources. Some data PBX vendors have developed the hardware and software needed to make the data PBX function like a local-area network terminal server, thus allowing ASCII workstations to access a local net. Another new application is to add printer-spooling software so that the data PBX can function as a poor man's local network.

Hunter is president of TMS Corp., a telecommunications consulting firm in Devon, Pa.

How they work

Data PBXs provide services that allow terminal users to contend for computer ports. Without port contention, each network user would require a dedicated port, regardless of whether or not the port was needed full time. Since such ports are extremely expensive, dedicated ones are a luxury few organizations can afford.

Data PBXs are used in a star configuration, with all terminals connected to a centralized switching unit. Local terminals are directly connected, while remote terminals are accommodated through dial-in/dial-out ports. Either way, all users can avail themselves of the same switch services. To handle large networks, some vendors furnish expansion modules that can be distributed at the same site or to different locations and linked to the central switch directly or over

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NETWORK WORLD

Data switches

Vendor	Product	Channels per node	DTE data rate (bit/sec)	DTE interface	Data throughput per node (bit/sec)	Number of composite links/ maximum speed (bit/sec)	Flow-control signals	X.25 interface	LAN interface	Session toggling/ number of sessions	Protocol conversion	Data over voice	Redundant logic and power	Minimum/ maximum price
Applied Innovation, Inc. Columbus, Ohio	AISwitch Series 180	256	19.2K asynchronous	RS-232-C, RJ-41 telephone	9.8M	8/9.6K	XON, XOFF, RTS, DSR, DTR	✓		✓/unlimited			Both	$4,200/ $28,000
	AISwitch Series 90	64	19.2K asynchronous	RS-232-C, RJ-41 telephone	9.8M	8/9.6K	XON, XOFF, RTS, DSR, DTR	✓		✓/unlimited				$2,000/ $5,000
Develcon Electronics, Inc. Dublin, Calif.	DevelNet	20,000	38.4K asynchronous; 9.6K synchronous	RS-232-C, RS-422	24M	Unlimited/ 100M with fiber optic; 1.544M with T-1	XON, XOFF, CTS, DSR, RTS	✓	IEEE 802.3 TCP/IP		Asynchronous to IBM 3270 SNA/ SDLC, BSC	✓	Both	$6,000/ $500,000
Equinox Systems, Inc. Miami	DS-15	1,320	19.2K asynchronous and synchronous	RS-232-C, RS-449, current loop	25M	55/1.544M; low-speed links through external multiplexers	DTR, CTS, DSR, RTS						Both	$9,500/ $50,000
	DS-5	240; 960 with multiplexing	19.2K asynchronous and synchronous	RS-232-C, RS-449, current loop	25M	NA/ 1.544M; low-speed links through external multiplexers	DTR, CTS, DSR, RTS						Both	$6,600/ $23,000
Gandalf Data, Inc. Wheeling, Ill.	PACX 2000	1,920	19.2K asynchronous and synchronous	RS-232-C, CCITT V.11	1.288G	62/1.544M with T-1; 100M with fiber optics	XON, XOFF, RTS, CTS, DTR	✓		✓/5		✓	Both	$16,000/ $250,000
	PACX 200	128	19.2K asynchronous and synchronous	RS-232-C, CCITT V.11	1.288G	NA/1.544M with T-1; 100M with fiber optics	XON, XOFF, RTS, CTS, DTR	✓		✓/5		✓	Both	$4,000/ $40,000
Infotron Systems Corp. Cherry Hill, N.J.	NX 4600	4,000	2.4K to 1.024M synchronous; up to 19.2K asynchronous	RS-232-C, CCITT V.35 and V.11, Military Standard 188-114	NA	10/1.544M; 56K and 2M available	XON, XOFF, RTS, CTS, DC1, DC2, DC3						Both	$25,000/ $100,000
Micom Systems, Inc. Simi Valley, Calif.	InstaNet 6000, Series 40	2,036	19.2K asynchronous; 9.6K synchronous	RS-232-C	10M	32/72K; 16/1.544M	XON, XOFF, RTS, CTS, DC1, DC3	✓	IEEE 802.3 TCP/IP or XNS	✓/2	Asynchronous to IBM 3270 SNA/ SDLC, BSC	✓	Both	$11,200/ $300,000
	InstaNet 6000, Series 20	250	19.2K asynchronous	RS-232-C	2.5M	4/56K or 1.544M	XON, XOFF, RTS, CTS, DC1, DC3	✓	IEEE 802.3 TCP/IP or XNS	✓/2	Asynchronous to IBM 3270 SNA/ SDLC, BSC	✓	Both	$2,500/ $8,000
MicroScience Corp. Atlanta	Q-Net	128	19.2K asynchronous	RS-232-C	2.4M	16/19.2K	XON, XOFF, DTR, CTS							$7,000/ $14,000
Quasitronics, Inc. Houston, Pa.	Q8000	64	19.2K asynchronous and synchronous	RS-232-C	1.2M	1/64K	XON, XOFF, DTR, CTS, DSR							$795/$8,000
Sequel Data Communications, Inc. Raleigh, N.C.	SDC 660	60	19.2K asynchronous	RS-232-C, RS-422, current loop	NA	5/64K	XON, XOFF, CTS, TPAUSE			✓/2		✓	Both	$2,600/ $7,000
	SDC 6192	1,536; 3,072 with multiplexing	19.2K asynchronous	RS-232-C, RS-422, current loop	NA	80/64K	XON, XOFF, CTS, TPAUSE			✓/2		✓	Both	$2,600/ $40,000
Tek-Com/Prentice Corp. Sunnyvale, Calif.	MetaPath DDS Family	64	9.6K asynchronous	RS-232C, RJ-41 telephone	2M	64/2M coaxial; 9.6K leased line	XON, XOFF, TPAUSE			✓/2			Both	$1,100/ $14,000
Tellabs, Inc. Lisle, Ill.	Model 331	32	9.6K asynchronous and synchronous	RS-232-C	320K	18/76.8K	XON, XOFF, CTS, DSR, TPAUSE	✓		✓/2				$2,500/ $11,700
Telecommunications Data Services, Inc. Irvine, Calif.	Datos	256	19.2 asynchronous; 56K synchronous	RS-232-C, RS-422	49M	4/19.2K	XON, XOFF, RTS, CTS, DSR			✓/4		✓	Both	$1,700/ $50,000

BSC = Binary Synchronous Communications
CTS = Clear to send
DC1 = Device Control 1
DC2 = Device Control 2
DC3 = Device Control 3
DSR = Data set ready
DTE = Data terminal equipment
DTR = Data terminal ready
RTS = Request to send
SDLC = Synchronous Data Link Control
SNA = Systems Network Architecture
TCP/IP = Transmission Control Protocol/Internet Protocol
TPAUSE = Tandem Computers, Inc.'s Tandem Pause
XNS = Xerox Corp.'s Xerox Network System
XOFF = Transmitter off
XON = Transmitter on

This chart includes a representative selection of vendors in the data switch market. Most vendors offer other data switches, and many vendors not included offer a full range of competitive products.

SOURCE: TMS CORP., DEVON, PA.

(continued from page 41)

communications lines. While such nodes might be physically remote, they are logically part of the central switch and under control of a single network management system.

Architecture

All data PBXs have control logic, power supplies and channel cards. The control logic contains the operating system plus the software and memory needed to assemble message frames. Time-division multiplexing is used to assign each user a time slot on the high-speed bus and internode trunk, and since bandwidth is not infinite, the number of channels that can be handled decreases as the channel speeds increase. That must be kept in mind when evaluating how many terminals the data PBX can accommodate without blocking.

Many data PBXs support distributed nodes that are cable-connected to the main cabinet or connected through leased telephone lines. For remote locations, some products support AT&T's Dataphone Digital Service interfaces that allow data transmission at 56K bit/sec. A few of the products have T-1 drivers for connecting the remote locations over AT&T's Accunet T1.5 facilities, and some have fiber-optic cable interfaces.

Component redundancy

Many data PBXs offer redundant control logic and power supplies and a few even provide a redundant backplane.

> Several vendors have implemented session toggling (also called hot keying) to permit users to establish multiple sessions and move among them by striking one or two keys.
>
> ▲▲▲

While component redundancy means the same thing to all vendors, it can be implemented in vastly different ways. Redundant control logic and power supplies come in two forms: standby and hot standby. With a standby system, the control logic must be configured and the power supply must be switched on when it assumes control, thus causing all processing operations to cease until switchover is completed.

With hot standby, the system is always powered on and works in conjunction with the primary logic, assuming its functions in case of a failure. Switchover to central redundant control logic is automatic for all products listed in the accompanying chart except Telecommunications Data Services, Inc.'s Datos, which is manually switched.

Access management

Data PBX vendors advertise the ability to handle a large number of inputs, but that doesn't necessarily mean that they are all directly connected to the unit through individual channel ports. Frequently, statistical multiplexers are used to connect several terminals over one composite link using just one line port.

For example, the Equinox Systems, Inc. DS-5 data PBX supports 960 channels when multiplexers are used, but only 240 of them are physically connected.

When ports are dedicated to individual users, no access restrictions are required. However, since the data PBX allows many users to contend for multiple ports, the ability to restrict who accesses what and when is critical. That can be handled by user and group passwords, and group restriction to certain ports. Every data PBX in this survey supports those restrictions.

For dial-in users, some switches require special procedures to be carried out before the user can receive recognition, such as striking the return key a certain number of times. Other switches use callback procedures in which a user password is associated with a telephone number. When a password is received, the data PBX hangs up and calls the associated number. Vendors supporting such callbacks are Equinox, Sequel Data Communications, Inc. and Applied Innovation, Inc.

All data PBXs queue callers to busy resources, and most inform them of their position in the queue. The more sophisticated switches also support user-assigned priorities that the data PBX uses to grant access. A few vendors even allow high-priority users to be moved to the top of the queue over lower priorities.

Products in the chart that don't support this priority scheme are those from Telecommunications Data Services, Micro-Sciences Corp., Quasitronics, Inc. and Tellabs, Inc.

Several vendors have implemented session toggling (also called hot keying) to permit users to establish multiple sessions and move among them by striking one or two keys. Such toggling obviates the need to log off and on when moving between sessions, thus saving user and PBX time.

External communications

Every data PBX has some form of external data communications to allow interfacing with other data PBXs or host communications processors. In addition to primary data routes, the better data PBXs can also be programmed to handle secondary and alternate routes, should the primary fail or become too congested. Some will even perform adaptive routing, in which the switch selects the best communications route between the source and destination based on certain performance parameters,

(continued on page 51)

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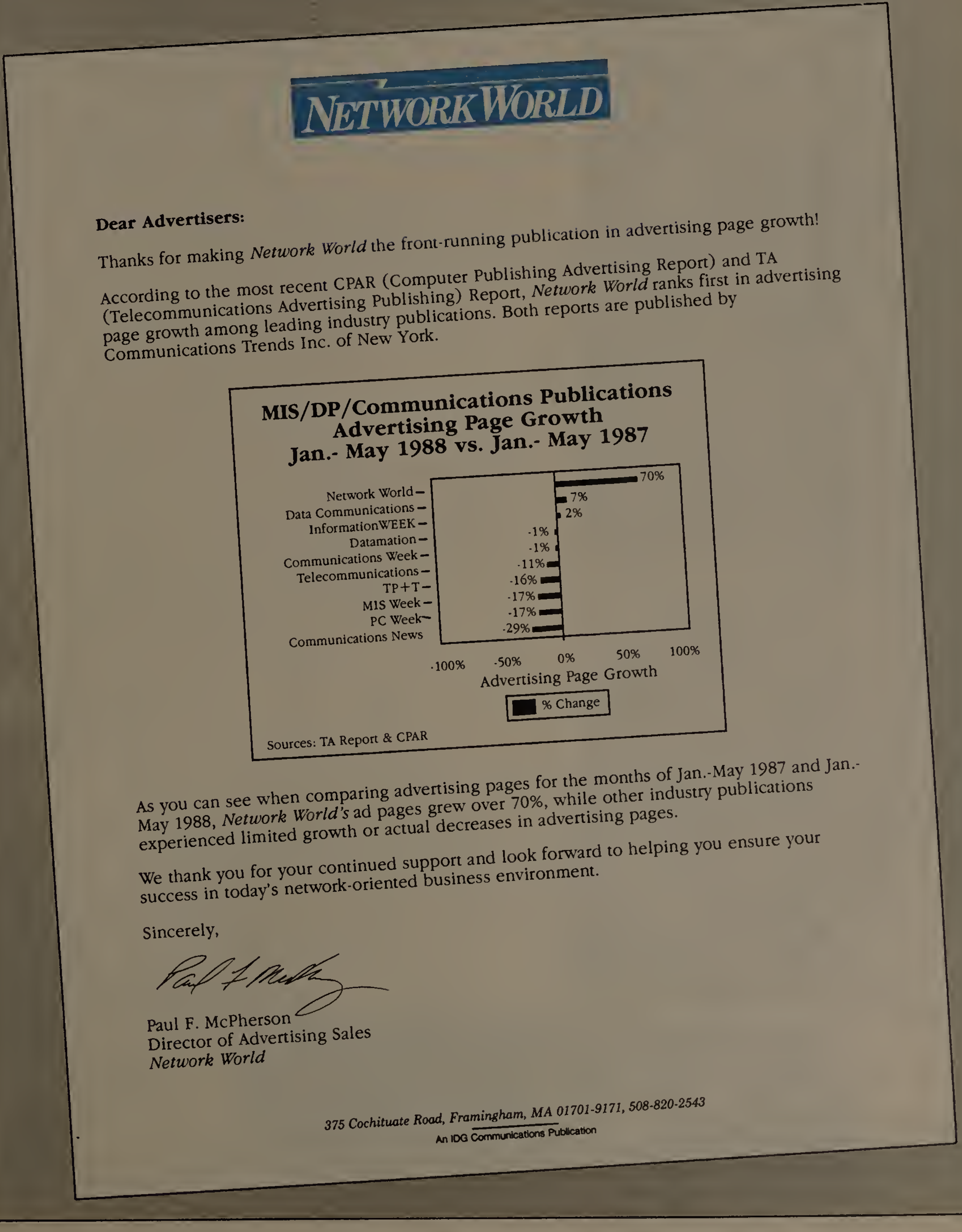

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Sources: TA Report & CPAR

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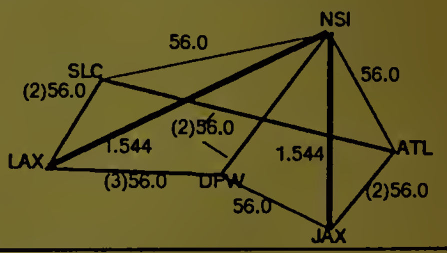

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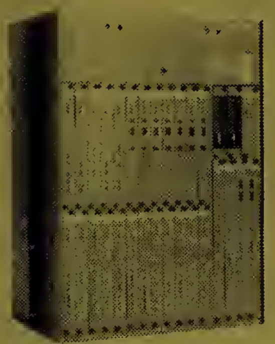

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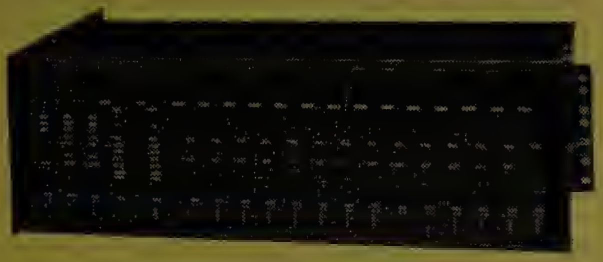

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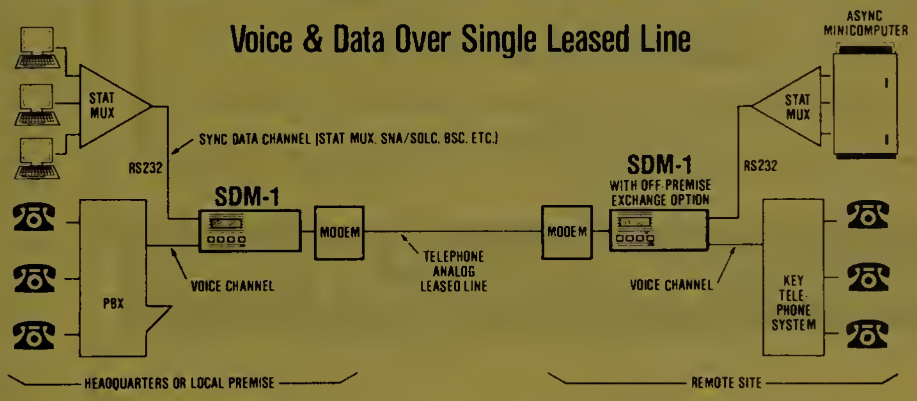
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Homegrown net management

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vendor's NEMS with minimal effort. The ideal net management system will provide a common user interface for the network operator, can run under any operating system or hardware platform, and can be interfaced to and manage any kind of network. Its functionality should at least include the facilities mentioned in the International Standards Organization (ISO) OSI model. Unfortunately, the ideal doesn't exist commercially.

In recent years, many attempts have been made to provide the ideal net management system. All the vendors with a networking strategy have announced a management system, based on their environment, and have claimed it to be the de facto industry standard.

Current limitations and vendor insistence on proprietary architectures notwithstanding, the marriage of the two schools of thought outlined above is imminent. Based on the progress of the standards bodies under the ISO/OSI architectural umbrella, true net management systems will be arriving in the near future.

> The area of network management standards is the most difficult to implement and has not received the proper amount of attention.

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In the ISO/OSI model, the network management aspects are covered under the Draft International Standard 7498/4 (addendum to the basic ISO model definition), the Draft Proposal 9595 (management information services) and Draft Proposal 9596 (management information protocols). While the details and protocols defined in these drafts are beyond the scope of this article, they can be summed up in a few words.

The ISO network management specifications define several protocols that encompass the basic layers of the OSI model. These network management protocols do not constitute an eighth layer but rather provide adjunct functions to the other layers for data collection and information distribution. The data collected and distributed deals with fault, configuration, accounting, performance and security management, as well as naming and addressing.

The area of network management standards is the most difficult to implement and, unfortunately, has not received the proper amount of attention until recently. Due to the realization that a networking architecture is not complete without net management system specifications, the ISO's Joint Technical Committee 1 SC21, or OSI committee, has amplified its efforts, and more people worldwide are engaged in standards development.

AT&T's UNMA also addresses the problem. It even claims to use the ISO/OSI model as its architecture, but the fact remains that it is a system provided by a vendor and other vendors might not choose to adhere to it.

When the ISO/OSI model becomes an industrywide standard supported by the user community, vendors will have to adhere to it. The management of the corporate network will be accomplished from a single location or if needed, from distributed locations, using a common operator interface and an international set of standards.

The financial trading game

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Two methods exist to decrease this lead time and eliminate the need to maintain blotters. Moving the data-entry clerks to the trading floor so they can be near the trades is an option, but this is seldom done because of the high value of trading floor space.

A second alternative is for the traders to enter the deals themselves. But the foreign exchange market moves rapidly, and traders may not have time to enter deals unless the entry method is extraordinarily efficient and user-friendly.

Among the many existing methods of direct entry are keyboards, touch screens, writing tablets, light pens and voice-activated equipment.

Touch-screen technology has been discussed a great deal recently in the trading industry. It is expensive, costing from $40,000 to $60,000 per station, including systems and networking hardware. It is questionable whether traders can generate the additional profits necessary to justify the capital outlay.

Is technology pulling the user here, or is there a legitimate place for direct deal entry? Opinions are mixed. Traders have often realized high profits in the volatile foreign exchange market, and this has occurred without the assistance of automated deal entry.

On the other hand, efficient direct entry systems could increase the information flow to traders, giving them instant knowledge of their position without the need to keep blotters.

■ **Contingency.** Contingency is an outage of part or all of the trading floor's communications capabilities. It is more severe than common outages such as dead dial-tone lines or monitor failures. Contingency can result from fire, flood, power outage or cut cables. It takes on a more urgent nature than in other parts of a bank due to the time-critical nature of a trading floor.

As new services and equipment are introduced to the desktop, it is imperative to review contingency. For example, if local-area networks are used for transmitting production data, fully redundant, fault-tolerant networks should be considered.

■ **Vendor management.** Trading environments typically entail more different types of equipment and services than traditional data processing environments. The single-vendor approach is practical for systems that are common throughout the floor: turrets, video switching or digital information distribution systems and intercoms.

In other categories that are more individual to users, the multivendor approach is preferred. Areas in which using multiple vendors can be justified include providing private-line route diversity, providing multiple access paths to international telex locations and providing traders with different available market information services.

Future issues

Several future trends are evident in the financial trading industry.

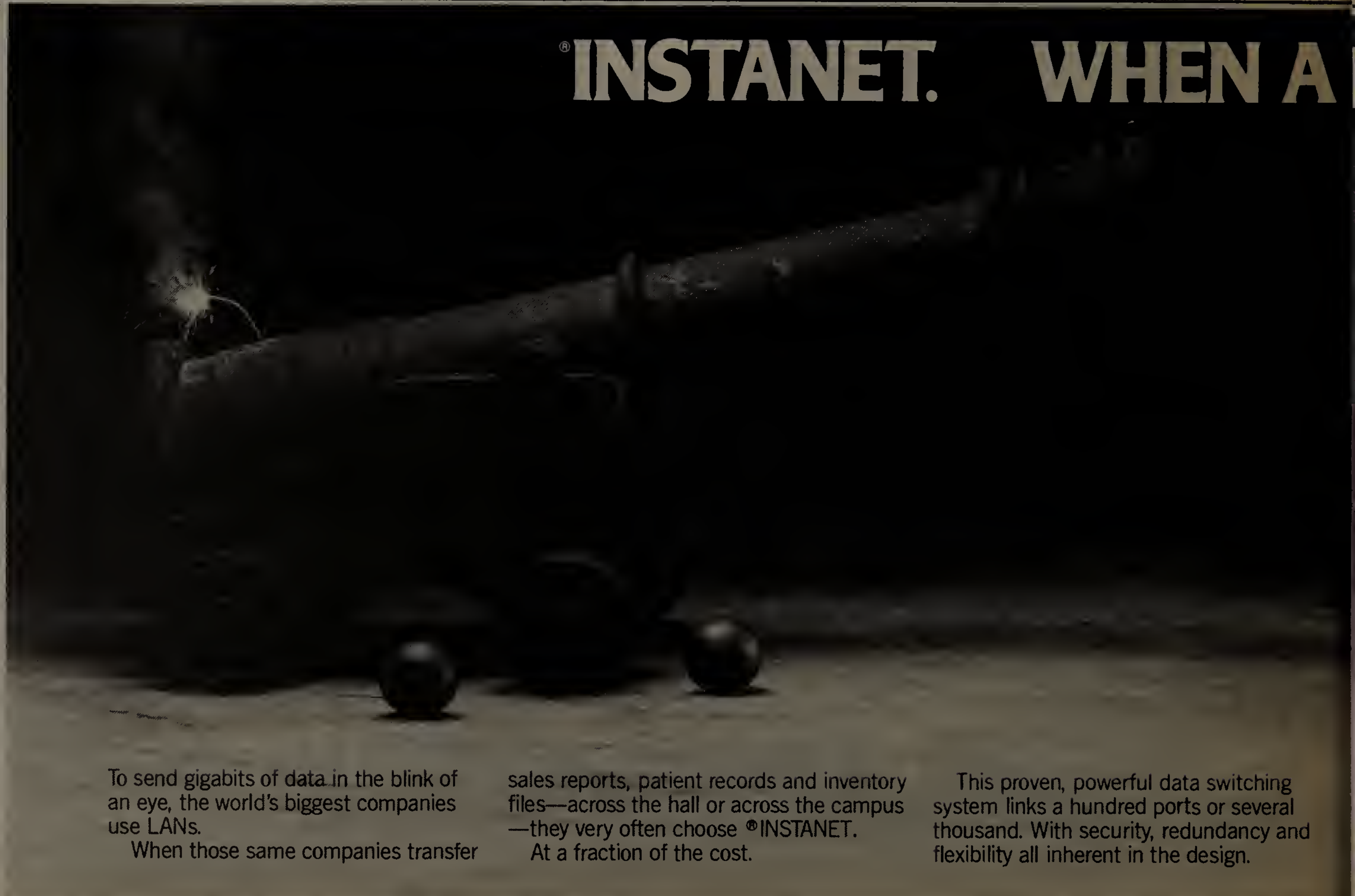
Although still in an embryonic stage, artificial intelligence will become more prevalent in the financial trading environment and will allow for more automated decision-making. This new capability will raise challenging issues because traders are used to making their own decisions without the aid of computers. They may view artificial intelligence as an infringement on their privacy and autonomy.

Advances in networking technology will enable trading floors to communicate with one another easily, even if they are widely dispersed geographically. Increased availability of transoceanic cables will continue to decrease dedicated line charges. Networking major trading floors will thus become easier and less expensive. This trend will occur both intra- and intercompany.

The use of FDDI is inevitable due to the massive amounts of data and increased graphics capabilities needed. Today's local networks are incapable of carrying the huge amounts of data used by large trading floors.

Finally, network management will increase in importance. The critical, time-sensitive nature of financial trading networks will demand proactive monitoring rather than reactive behavior.

The constant changes in technology and business requirements in the financial trading industry demand that communications staffs continue to become more flexible and responsive. They must build networks that can support new real-time networking technologies while simultaneously remaining cost-effective.



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A switch in direction

continued from page 43

such as eliminating delays due to traffic congestion on certain links.

Gateways to diverse host computers are another option offered by a few switch vendors and they are always in the form of protocol converters. The most common gateway allows an ASCII terminal user to transparently access and converse with incompatible hosts, and the emulation most frequently offered is IBM 3270, which emulates a 3X74 cluster controller and 3X78 or 3X79 workstations.

Network management

Data PBXs constantly monitor the operation of all components and signal problems by lighting LEDs on the applicable card and sending a message to the network management terminal. Gathering performance statistics is another important feature.

The most elementary statistics include port usage, total data errors, channel and port outages, alarms received and unauthorized access attempts.

Sophisticated reporting will indicate the number of attempted connections to busy or restricted ports, connection requests placed in a queue, data errors on a per-channel and per-port basis, and peak number of connections over a user-specified time period.

Such statistics can also be used for systems planning or reconfiguring the existing network.

New frontiers

As noted above, some vendors have developed interfaces that allow the data PBX to function like a terminal server that is directly connected to an Ethernet local network running under Transmission Control Protocol/Internet Protocol. "That's a strong application since it permits dumb ASCII terminals to access LANs, something they can't easily do," Glencom's Falkowski states.

"LANs are designed primarily to handle PCs, and lots of interface cards are available to let them attach. However, no card is offered for dumb terminals," he continues. "By using the PBX, terminal users not only get LAN connectivity but local switching services too."

The University of California at Davis is using a data PBX in exactly that manner. According to Russ Hobby, the university's data communications manager, its Develcon, Inc. DevelNet connects 2,000 on-premises and dial-up users to resources located on the Davis campus as well as at other University of California locations around the state.

"We need to connect to computers running on LANs here and at other [university] locations, and the switch and gateways allow us to do that," he states.

Hobby considered using remote Ethernet terminal servers and individual dial-up connections but rejected them.

"With the LAN server, extensive wiring would have to be done, and we'd also lose the ability to manage that part connected to the LAN portion of the network," he says. "We looked at having users dial up the remote computers directly, but that would have incurred separate session and separate long-distance charges."

A new wrinkle on an old application is the employment of the data PBX as a local net. While that concept has been tried before and found wanting because resource sharing was too inefficient, two vendors have developed software that remedies that situation. The Equinox SwitchLAN, used with its DS-X, and the Quasitronics Q8000 both have printer-spooling services and offer a means whereby personal computers can exchange files in background mode. By spooling data to a printer queue, users can continue productive processing rather than wait for a printer to become available.

Dominic Abate, Midwest sales support manager for Hewlett-Packard Co. in Rolling Meadows, Ill., says he feels that printer spooling is a must if the data PBX is used as a local network. "If it doesn't offer spooling when the desired printer is busy, users have to camp on and therefore can't continue working," he explains.

Printer spooling is one reason Hughes Aircraft Co. in Denver decided to add SwitchLAN to its Equinox DS-15. "We have four different locations served by the switch, some of which have as many as 40 users connected," says Matt Reynolds, senior systems engineer.

Hughes desired to share its printers but wanted to make the process as transparent as possible to users by avoiding long queues when the selected printer was busy.

"The only other way we could have done that was to dedicate a port to each user and buy other special printer-sharing hardware. With the [SwitchLAN], it's all taken care of in software," he states.

Equinox and Quasitronics also offer software that permits personal computer files to be transferred in background mode, thus freeing the unit for other work. Exchanging files in background mode is also a performance enhancer, since the personal computer screen isn't occupied during the exchange, and the operator can continue with other processing.

"I like the concept of using background transfers, provided the files aren't too large," says Falkowski, "and that's generally the case with most PCs."

For large files, however, the transfer takes too long, he says, referring not only to data transfer rates but to the fact that the MS-DOS operating system is single-tasking and must service multiple jobs on a time-slicing basis. That slows both foreground and background processing.

Summary

The role of the data PBX is changing. It will continue to find buyers looking for a port sharer, but that market is diminishing as more companies move toward local-area networks and multiplexers to link users with resources.

Those alternatives handle more inputs and provide higher data-transfer rates than most data PBXs, and most of the better switching statistical multiplexers and T-1 multiplexers have port-queuing facilities that are the equal of the best data PBXs.

Most data PBX vendors realize the important role of local-area networks in current and future networks and have decided to join the parade rather than be trampled by it. While currently only a few have a direct-connect local-area network facility, many of the larger vendors state that they are studying that feature for future releases.

Some also realize that data PBXs may get a new lease on life by supporting local-area network-like services such as print queuing. While Equinox and Quasitronics are the first to offer that facility, Sequel is readying an entry for release early next year.

Another factor that will keep the data PBX afloat is price. With an average cost of between $100 and $200 per port, it enjoys a substantially lower price than local-area networks, which are in the $400 to $1,295 range for realistic configurations ("Scrutinizing LANs," *NW*, Feb. 22).

The data PBX also costs less on a per-port basis than T-1 and switching statistical multiplexers, although the latter are getting close as vendors continue price cutting ("The top-shelf switch," *NW*, April 11).

Industry experts differ on whether the data PBX and switching statistical multiplexer is a better choice in the connectivity game.

However, Falkowski offers this advice: "If most terminals accessing the resource are remote, go with the switching stat muxes. They handle more terminals since the communications line can be overbooked. If most users are local, use a [data] PBX." ◻

Letters

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Use of ISDN PRI to help firm grow

continued from page 1

WATS Marketing joins American Express Travel Related Services Co., based in Phoenix, as an early ISDN Primary Rate Interface user ("Amex details experience with ISDN at user meeting," *NW*, Oct. 3).

The company supports the ISDN facilities from its Northern Telecom, Inc. Meridian SL-1 private branch exchange equipped with ISDN Primary Rate Interfaces. The Primary Rate Interfaces divide 1.544M bit/sec T-1 digital links into 23 64K bit/sec B channels for voice and data communications and one 64K bit/sec D channel for signaling.

Besides supporting incoming telephone calls, the Primary Rate Interfaces provide a path for data that tells where the telephone call is coming from, a capability called automatic number identification (ANI) that AT&T markets as a service feature called INFO-2.

Today, when customers call the company, their phone number is displayed on the LCD screen of a WATS Marketing agent's telephone. The operator then keys in the number on a computer terminal, which initiates a data base search and calls up the customer's records.

Operators verify information in the data base and update it if necessary, a procedure that has improved record-keeping at the company.

When WATS Marketing finishes installing its Primary Rate Interface this fall, customer phone numbers will automatically come up on operator terminals instead of on their telephones. This will save the agent from having to key in the phone number. It will also shorten each phone call by as much as 10 seconds, a time savings that will enable WATS Marketing to handle a million additional calls a year, Denine estimated.

The ISDN service will also enable the company to better handle peak periods, when incoming phone traffic exceeds WATS Marketing's capacity. "Calls often flood our offices following television commercials that have advertised products using our 800 numbers," Denine said. "We have estimated that INFO-2 will allow us to handle 10% more calls during these high-volume periods. This provides a bigger revenue return for our clients and us as well."

> "INFO-2 will allow us to handle 10% more calls during high-volume periods," WATS Marketing's Denine said.
>
> ▲▲▲

WATS Marketing of America divides its operators into 15 different groups to handle certain products or companies by using AT&T's Megacom 800 service and Dialed Number Information Service (DNIS).

DNIS distinguishes which 800 number customers are calling in order to determine the operator group to which the call should be routed. The SL-1 uses an automatic call distribution (ACD) package to distribute the calls evenly to waiting operators in each group.

When the company arranges to have ANI information sent to WATS Marketing agents' terminals, instead of to their phones, the ANI data will be routed from the SL-1 across an X.25 link to an IBM 3090 mainframe located in the same city but five miles away at First Data Resources, Inc., another American Express company.

From the IBM system, the ANI information will be routed over digital dedicated circuits back to IBM and ITT Corp. terminal controllers that support the WATS Marketing operators.

Denine estimated that ANI information will pass from the SL-1 PBX to the appropriate operator's terminal in about one second.

Northern Telecom provided the software and hardware needed to make the SL-1 compatible with ISDN. This included interface boards and X.11 Release 12 software for the switch.

Denine estimated that the cost of installing six new T-1 ISDN Primary Rate Interface lines planned for this fall will exceed $100,000. Costs include the price of hardware, software and custom programming of the SL-1. Additional costs will include AT&T charges for each phone number it provides under its INFO-2 service and monthly service fees.

Despite the hefty investment, Denine was confident that the new service would pay for itself within a year.

3Com offers enhanced 3Station/2E

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80287 coprocessor for the faster numerical processing required in CAD and financial applications. "For applications that require heavy computation, it speeds up the process significantly," Rosekind said.

According to Rosekind, the 3Station has proved particularly popular among MIS directors. "Because it's diskless and slotless, it affords them greater control over the user configuration and offers improved security," he said. "The fact that it's diskless also means that no one can introduce a computer virus into the network."

But both Rosekind and Robert Metcalfe, general manager of 3Com's Distributed Systems Division, acknowledge that netstations, as a new product class, are not for everybody. "Power users who want the latest and greatest add-on boards haven't been attracted to it," Rosekind said.

"We're not trying to say that netstations are replacements for PCs," Metcalfe added. "In fact, for every 200 PS/2s that IBM sells, we sell just one 3Station. Netstations are principally for people who have better things to do than back up their diskettes."

The company also said that, effective Nov. 1, it will raise the price of the original 3Station from $2,195 to $2,495. The company will sell the new 3Station/2E for that same price when it begins shipping next month. Rosekind attributed the price hike to the rising cost of dynamic random-access memory semiconductor chips.

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A. Total number of copies printed (net press run)	79,386	84,133
B. Paid and/or requested circulation		
1. Sales through dealers and carriers, street vendors and counter sales	None	None
2. Mail subscriptions (paid and/or requested)	70,096	70,507
C. Total paid and/or requested circulation	70,096	70,507
D. Free distribution by mail, carrier or other means, samples, complimentary and other free copies	8,168	11,572
E. Total distribution (Sum of C and D)	78,264	82,079
F. Copies not distributed		
1. Office use, left over, unaccounted, spoiled after printing	1,784	2,054
2. Returns from news agents	None	None
G. Total (Sum of E, F1 and 2 — should equal net press run shown in A)	79,386	84,133

I certify that the statements made by me above are correct and complete.

Alice Coronella
Traffic Manager

Group sets health care net standard

continued from page 1

tions technologies. Integrating products or adding equipment typically requires the development of ad hoc interfaces.

Hospitals are hoping that HL-7 will be adopted as an industry standard, which would help them integrate multivendor environments. Although the Institute of Electrical and Electronics Engineers is working on a standard for medical data interchange, the fruit of the IEEE's labor is not expected for several years.

Like hospitals, vendors hope for a more immediate solution. "The fact that vendors can write for one standard and serve multiple clients represents economy on their part in terms of support and maintenance," said James Gabler, chief information officer for Santa Rosa Health Care Corp. and an HL-7 committee member.

Today, hospitals often cannot pass patient data back and forth between systems used in hospital laboratories, radiology departments and pharmacy departments. And although vendors can program their product interfaces to the proprietary protocols of other vendors', such as Simborg Systems Corp.'s Statlan, a standard method of integrating systems is not available.

"It's not enough to have connectivity between computers passing ASCII characters," said Wes Rishel, vice-president of product development at Greenbrae, Calif.-based Simborg and a committee member.

"Hospitals need more agreement on application-level protocols to exchange data," Rishel said. "When a patient is admitted, the admitting department needs to notify other departments. Also an application protocol is needed [to determine] the admission date, how the patient is identified and when that information is to be sent from one department to another."

As a multilayered protocol, HL-7 is designed for three distinct network environments. For baseline nets that use protocols that compare to the lower three layers of the Open Systems Interconnection model (like some RS-232 networks), HL-7 makes up for the inadequacies by providing protocols down through OSI's transport layer.

For most sophisticated networks with reliable error-checking capabilities, such as TCP/IP networks, the standard provides encoding rules only in protocols down through the presentation layer.

For more advanced networks, such as IBM Systems Network Architecture networks employing LU 6.2 protocols or full-fledged OSI networks, HL-7 rides on the top layer as an application.

Rishel said vendors and health care institutions agreed on this modular approach so that vendors could begin marketing products that support the standard now, while ensuring that the lower level functions of the standard do not become obsolete with the full implementation of the OSI model.

"In the environments of the future, where people will be able to use OSI presentation layer services routinely, they'll still be able to use our protocol," Rishel said. "And people using it today will have a smooth transition to those environments."

The HL-7 committee's members include the Hospital of the University of Pennsylvania, Case Western Reserve University of Cleveland, Indiana University Medical Center in Indianapolis, Moses H. Cone Memorial Hospital in Greensboro, N.C., AT&T Bell Laboratories, Unisys Healthcare Services in Charlotte, N.C., and Coopers & Lybrand in Los Angeles.

Samuel Schultz II, associate executive director for the Hospital of the University of Pennsylvania, is chairman of the committee.

Int'l net helps UPS set sights

continued from page 1

ages through customs. The documents can be transmitted either directly to customs bureau computers or to a customs brokerage serving the appropriate port of entry. This allows UPS to begin the clearance process hours before the package arrives in the distant country.

The network also is designed to let UPS employees and customers track international air packages from the point of exit in the exporting country through customs operations in the importing country. More than 550,000 international air packages are delivered daily.

"ISPS gives UPS a strategic edge in international package transport," said UPS Executive Vice-President Kent Nelson.

John Alden, UPS senior vice-president for business development, concurred. "Our network has led to a great reduction in the paperwork that could otherwise slow down the delivery of a package," he said.

UPS is in the midst of a $1.4 billion five-year plan, scheduled to end in 1991, to upgrade its computer network to make it the transportation industry's most advanced computer network operation, according to Francis Erbrick, UPS' vice-president of information services.

UPS' main data center in Paramus, N.J., has three mainframes — two IBM 3090-600s and one IBM 3081 — running IBM's DB2 relational data base management system. The processors support UPS package-handling operation centers around the world.

The operation centers are outfitted with personal computers. In locations with dozens of microcomputers, the personal computer traffic is typically concentrated using IBM 3174 terminal controllers. These sites are usually supported using a variety of high-volume dedicated lines, including T-1 circuits and X.25 packet-switched services, said Jeff Rakowski, international systems manager for UPS.

UPS locations with only a few personal computers simply dial into the Paramus mainframes. Most of the newly announced locations in Europe and the Pacific Rim will be supported with dial-up links until demand warrants the investment in controllers. However, Erbrick said, in "some of these countries, like China, we don't know what they'll allow us to do."

Within two years, UPS plans to support all international sites with X.25 packet services, Erbrick said.

How the network works

When a UPS driver in either the U.S. or a foreign country picks up an international package, he brings it to a UPS hub to begin the ISPS application process. There, invoice and customs information attached to the package by the sender is keyed into a personal computer and uploaded to DB2 in Paramus. The mainframes compile information about the package, such as tariff requirements, and make the information available to personal computers in the UPS operating center serving the destination.

The information is available on line to UPS operation centers in some importing countries, such as Canada and the U.S., or it can be downloaded to UPS personal computers in other countries at the user's request.

Serving two functions

Some of the operation centers abroad handle packages and double as customs brokerage houses, while others handle only packages and leave customs brokerage to third parties.

The operation center uses the net to get information about the volume and kinds of packages coming in, to ready customs clearance documents and to prepare for shipment. ISPS, for example, sends data on importers' clearance histories to UPS customs brokers, enabling them to calculate more easily the tariffs for each brokerage transaction on the same shipment type.

UPS customs brokers or third-party brokers manually present the documents to customs representatives, who decide which packages need to be inspected and which can be cleared. Customs representatives then give this information back to the UPS broker representative.

The UPS operation center then keys the updated package information into a personal computer and routes it back to Paramus. Some of the information is used by the operation center to ensure that packages that need to be inspected, such as those suspected of containing contraband, are set aside, while other data is used at the UPS computing center to generate customers' bills.

In the U.S., the process is more efficient because UPS can send information about incoming packages directly to U.S. Customs Service computers using the Automated Brokerage Interface, Erbrick said.

When packages are delivered overseas, sorters unloading one of UPS' almost 300 airplanes wave a scanning wand over bar-coded packages. Different beeping sounds emitted by the wand signal whether or not a package has been cleared by customs. It also sends a message about the package's location and status on line to a tracking data base in the Paramus computer center.

Customers can use a toll-free 800 number to inquire about the location of their packages.

As UPS' international delivery service grows, so will its network, Erbrick said. Currently, the international delivery industry is in its infancy, but UPS is planning to move its computer headquarters to larger facilities in Mahwah, N.J., within two years in order to keep pace with what it expects to be a burgeoning business. ◪

Calendar

Oct. 24-25, Boston — Electronic Messaging '88. Contact: Electronic Mail Association, 1919 Pennsylvania Ave., N.W., Washington, D.C. 20006.

Oct. 24-26, San Francisco — National Connectivity Symposium. Contact: Digital Consulting, Inc., 6 Windsor St., Andover, Mass. 01810.

Oct. 25-26, Newport, R.I. — 11th Annual Newport Conference on Fiber Optics Markets. Contact: Kessler Marketing Intelligence Corp., America's Cup Ave. at 31 Bridge St., Newport, R.I. 02840.

Oct. 25-26, Huntsville, Ala. — Second International Software for Strategic Systems Conference. Contact: The University of Alabama, Huntsville, Ala. 35899.

Oct. 25-27, Cambridge, Mass. — The Sixth Annual Seybold Executive Forum. Contact: Patricia Seybold's Office Computing Group, Suite 612, 148 State St., Boston, Mass. 02109.

Oct. 25-28, Washington, D.C. — 1988 Federal Computer Conference. Contact: Federal Computer Conference, P.O. Box 41045, 7315 Wisconsin Ave., Ninth Floor, Bethesda, Md. 20814.

Oct. 30-Nov. 2, New Orleans — NAWGA/IFDA Information Technology/Financial Management Conference. Contact: National-American Wholesale Grocers' Association, 201 Park Washington Court, Falls Church, Va. 22046.

Oct. 31-Nov. 2, New York — Unix Expo. Contact: National Expositions Co., Inc., 15 W. 39th St., New York, N.Y. 10018.

Oct. 31-Nov. 2, Orlando, Fla. — OSI Conference. Contact: Omnicom, Inc., 115 Park St., Vienna, Va. 22180.

Oct. 31-Nov. 3, Chicago — AUTOFACT '88 Conference. Contact: Society of Manufacturing Engineers, 1 SME Drive, Dearborn, Mich. 48121.

Oct. 31-Nov. 4, Chicago — James Martin World Seminar. Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

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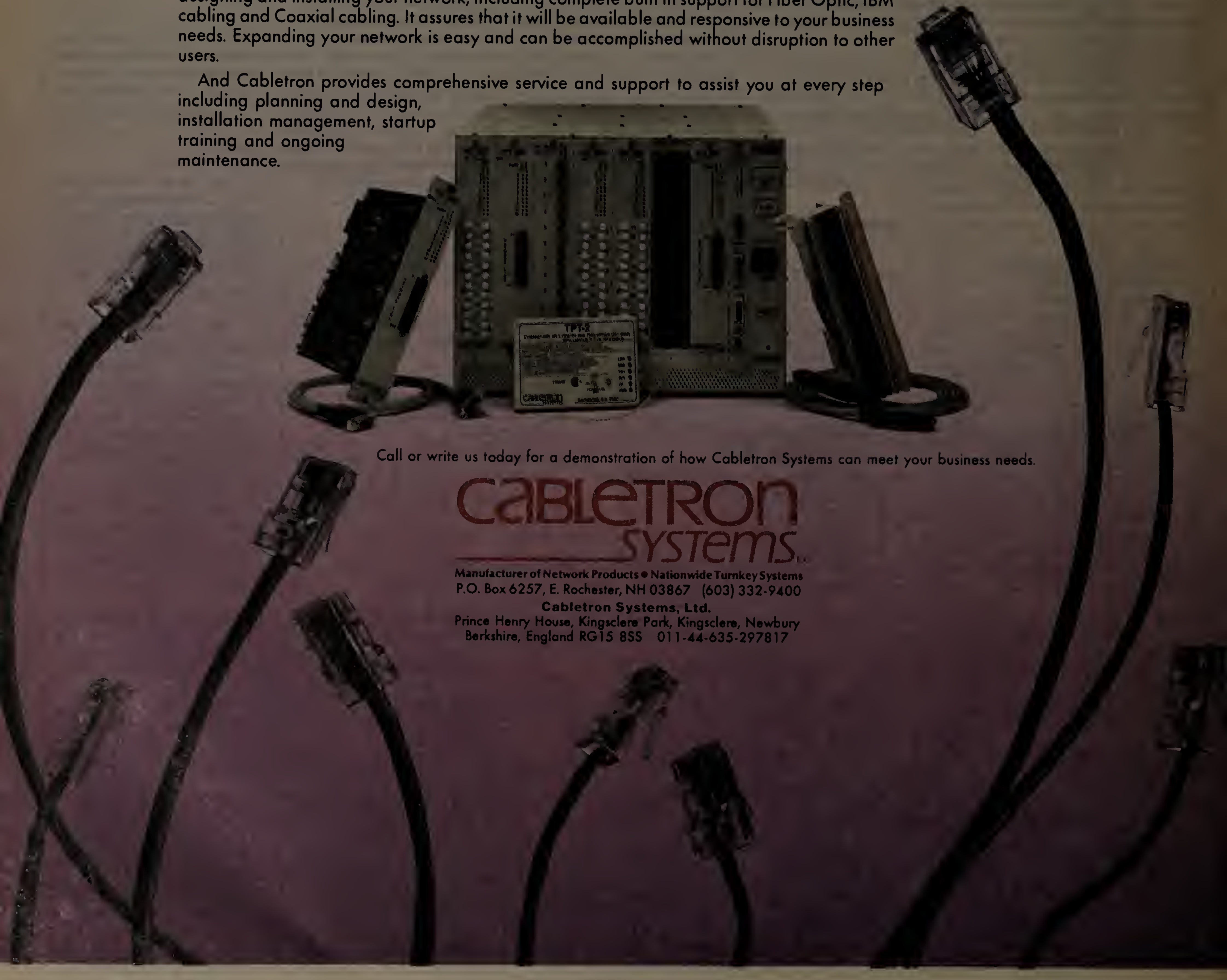

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